MARCH 14, 1955

NEWS ISSUE

Electrical World

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KCP&L CLINIC OFFERS COMPLETE SERVICE

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E B POWER
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RAPID CALCULATIONS by one of Card Programmed Calculators used by G.E. for turbine and power transformer designs are reviewed by Analytical Engr. Ed Magnusson and Lynn Wetherill, Mgr. Engineering, Power Transformer Dept. "CPC", like electronic analog computer used for switchgear designs, is setting the stage for lower cost electrical apparatus.

Now—electronic computers reel off equipment designs to cut system costs

Engineers free for creative design as machines do tedious calculation

Substantial savings in engineering time and greatly increased selection of apparatus design possible through General Electric's use of electronic computers points the way to a reduction in power system dollars per kva of capacity. In some instances savings of as high as 97% in the design time of large equipment have been made through the use of card program calculators, effectively reducing costs and at the same time permitting many more design approaches to be investigated.

CONSERVE ENGINEERING TIME

Calculating machines are helping engineers determine the most suitable turbine, power transformer and switchgear designs for any system. Their use has in many cases slashed the 15 to 40 hours of computation time formerly required on elaborate calculations to a single hour. Whether applied to preliminary specifications or to detailed product designs, such savings point to ultimately lower cost power system equipment.

BETTER PRODUCTS FORECAST

In addition, the new computers permit engineers to consider an extended range of equipment and system designs without incurring the high costs associated with old style methods. And computations can now be completed with greater accuracy.

Developments such as the application of electronic computers to electrical apparatus designs can help electric utilities obtain most suitable and efficient systems possible. To take full advantage of their speed and accuracy, contact your Apparatus Sales Engineer early in your system planning. General Electric Company, Section 301-278, Schenectady 5, N. Y.

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GENERAL ELECTRIC

Electrical World

Vol 143 No 11 March 14, 1955

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COMING NEXT WEEK—One of the greatest sources of revenue for electric suppliers, and one scarcely tapped, is commercial electric cooking. The vast possibilities offered by this market will be brought out in a special 12-page section. But even more important the ways and means by which all utilities can increase their revenues from commercial electric cooking will be pointed out by outstanding leaders in this field.

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UNITED STATES STEEL

EDITORIALS

Mutual Aid to Cope with Hurricane Damage

Electric utilities along the eastern seaboard must decide now what type of mutual aid organization is needed if they are to be prepared for next fall's hurricane season. Post mortems on restoration following last year's blows have disclosed many procedures and techniques for rehabilitating storm-damaged systems. Utilities along the hurricane paths are polishing up plans for digging out and keeping damage to a minimum.

But one important problem has not been settled. That is the procedure for rendering and obtaining inter-utility assistance—mutual aid. At a recent meeting one hurricane-experienced group of engineers praised the Emergency Assistance Roster plan used by utilities in Pennsylvania, Delaware, and Maryland. But they indicated a desire for some broader program encompassing larger groups of companies or for cooperating rosters from other regions to back up their own. On the same day at another meeting a panel of 11 engineers, equally weatherbeaten, recommended a nationwide mutual assistance pact to replace existing regional pool plans.

These proposals introduce two general plans for organizing mutual aid for utilities in distress. One takes the form of a clearing house for assistance information. It is a loose-knit organization. Under it larger utilities negotiate directly with one another for assistance, following prearranged procedures. They also act on behalf of smaller utilities in providing outside emergency aid.

The other plan discussed is much more formal. It envisions a central control group headed by a single coordinator who is assisted by representatives from utilities in and near a disaster area. This control group, convening upon threat of widespread utility damage, would receive requests for assistance, determine areas of greatest need, and dispatch available crews from participating utilities. In pure form this type of organization would replace and override the bilateral arrangements under which much of the emergency aid has been provided.

Both plans have merit. It may be that some features of both should be coordinated into the final type of organization that must be adopted. The criterion should be: What type of organization will provide prompt assistance to distressed utilities most effectively.

Helping to Multiply Progress

"United States progress in the first 150 years has been aided by the outstanding job of technical press reporting," Ralph J. Cordiner, president of General Electric Co, recently told a meeting of business paper editors. "If we are to answer successfully the challenge of the future, the business and technical press must become more proficient and expert than in the past," he continued.

Here is both a compliment and a challenge from a man who is intimately acquainted with the industrial press. He sees it from the point of view of both an industrial manager and an advertiser. The contributions of the press in promoting the exchange of ideas rank high among the factors which aid industry in multiplying progress.

The editors of most industry publications realize the responsibility that goes with this opportunity. It is the responsibility of careful and accurate reporting—getting the pertinent facts on all sides of an issue. Just as important is the sound interpretation of these facts once they are gathered and abstaining from the tendency to report trends where only hints of trends are beginning to appear.

The editor, of course, must depend on industry to supply the facts and the background information that is necessary for accurate reporting and sound commentary.

Industry and the industry press depend on each other for the rapid dissemination of information on better techniques, improved procedures, and technical advances. Once applied these add up to industrial progress which is passed on to the customers in the form of better goods and services.

Certainly Electrical World is dedicated to multiplying that progress for the benefit of the electric industry and all its customers.

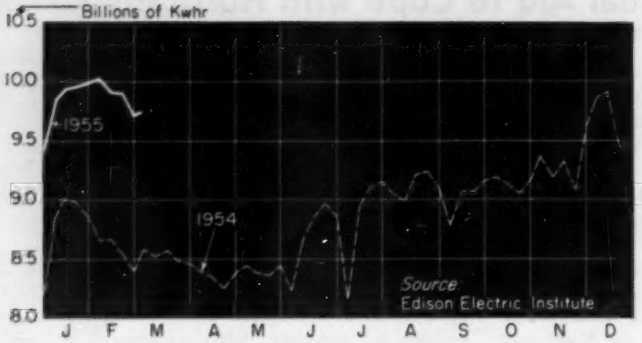
Cy Eaton Buys Back

Few people will quarrel with Cyrus S. Eaton's publicly stated reason for acquiring substantial investments in the electric utility field (EW, Mar. 7, p74). One may, however, question the timing. The reason he gave is that the trend toward public power is being reversed.

Those who have closely watched the trends should have known some years ago that the privately owned electric utilities have held their own in all but a few areas of the country. It is true that the Eisenhower Administration has somewhat tempered the federal contributions to public power, but this is a continuation of a policy that began in Congress seven or eight years ago. While there is still a threat of encroachment, it is not of dimensions that should weigh heavily in buying utility stocks.

Really, all Eaton had to say was that he is buying back because the stocks are a sound and profitable investment.

THE ELECTRICAL WEEK



OUTPUT

Week Ended Mar. 5

9,727,000,000 Kwhr

Up 13.3%

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Mar. 5	+13.3	+10.2	+6.9	+13.6	+6.9	+18.9	+11.8	+12.8	+16.8	+11.6
Feb. 26	+15.8	+10.3	+9.5	+13.7	+9.3	+26.8	+10.0	+17.1	+13.4	+16.8
Feb. 19	+15.9	+9.2	+9.8	+15.9	+9.9	+28.9	+8.6	+16.4	+8.9	+11.2

Seasonally Adjusted Index 183.0 Week Ago 183.3 Year Ago 161.0

The Issue's News Highlights . . . Senate subcommittee hears that ten private utilities in the Colorado area support the Administration's plan for developing the hydro-electric potential of the Upper Colorado River Basin . . . Co-ops submit to Rural Electrification Administration a five-year construction forecast on their expansion plans . . . To spur nuclear power progress, industry spokesmen at Congressional hearing ask for greater access to nuclear data.

Atomic Power: Some sections of Ontario will be using atom-generated electricity in less than ten years, according to H. A. Smith, co-ordinator at Canada's Chalk River atomic installation. Small pilot plant will be operating by 1958, he says . . . North American Aviation, Inc, will build what is claimed to be first reactor designed for private industrial research for Armour Research Foundation.

U. S. Chamber of Commerce has appointed Atomic Energy Committee to encourage development and use of atomic energy by private enterprise. Members will include Philip Sporn, president, American G&E, and William Webster, executive vice president, New England Electric System . . . America's first reactor school for foreign students gets under way this week at Argonne National Laboratory with 31 enrollees from 19 nations plus nine students from U. S. . . . Babcock & Wilcox will build plant near Lynchburg, Va., to make fuel elements and other reactor core components for nuclear power industry.

Heat Pump: "One out of every ten homes in 1965 will have all-year electric air conditioning utilizing the electric air to air heat pump," Atlantic City Electric's Pres B. L. England told N. Y. Security Analysts.

Consolidated Gas EL&P of Baltimore has agreed as part of an overall settlement to buy from Pennsylvania P&L all capital stock of Susquehanna Transmission of Maryland, wholly owned subsidiary of Pennsylvania Water & Power. Purchase hinges on regulatory approval of merger of Pennsylvania P&L & Pennsylvania W&P . . . Standard Power & Light files plan with SEC proposing to change from utility holding company to closed-end, nondiversified investment company.

Britain is not forgetting coal-generated power in its eagerness to develop nuclear-fueled power. British Electric Authority has ordered from English Electric Co a 200,000-kw turbo-generator. This will be twice size of largest generator now in commission in Britain, and is believed to be largest in Europe. First of five similar generators, it will have boiler operating at 2,450 psi and 1060 degrees F with reheat to 1,005 degrees F and output of 1.4 million lbs of steam per hour.

NEWS OF THE INDUSTRY BRIEFLY TOLD

Off the Washington Wire . . . Group of utility officials met with AEC last week to discuss upcoming regulations under 1954 revision to atomic law. They were followed by equipment makers. Regulations will be published in Federal Register shortly . . . Senate half of Joint Congressional Committee on Atomic Energy has unanimously approved nomination of Dr John von Neumann as fourth AEC commissioner.

Sen Wayne Morse (D-Ore.,) has obtained 30th Senate signature on his federal Hells Canyon bill introduced last week . . . Sen Albert Gore (D-Tenn.,) is opposing nomination of Joseph Campbell, former AEC commissioner, to be comptroller general because of Campbell's vote in favor of Dixon-Yates contract.

Senate Agricultural Committee has approved Thye-Aiken Bill (S 153) to repeal state allotment formula limiting distribution of REA loans on basis of ratio of nonelectrified farms in each state . . . REA Administrator Ancher Nelsen has promised to extend payment on $13.6 million in loans by Central Electric Power Co-op of Columbia, S. C., if co-op can assure its customers against rate increase. Meanwhile, South Carolina Senate Finance Committee approves investigation of Santee-Cooper finances.

Lower soft coal prices are spreading from some West Virginia mines to Pennsylvania coal mines. Central and western Pennsylvania coal producers have cut prices 10¢ a ton, effective in most cases on shipments starting April 1, to eastern electric utilities and other customers.

Oregon State Rep Walter J. Pearson has introduced bill in legislature for creation of State Power Commission with authority to develop power itself . . . British Columbia's Electric Power Act is being amended to B. C. Power Act to permit the B. C. Power Commission to go into gas business.

EEI's 21st Annual Sales Conference opens March 28 in Chicago with 57 speakers, including top industry leaders, scheduled to speak . . . Ontario last week began five-year project of changing Toronto area from 25 cycle power supply to 60 cycle. This is final stage of program started five years ago to cover 940,000 electric customers in 12,000-square mile area of southern Ontario.

ABOUT PEOPLE IN THE INDUSTRY

Rocky Mountain Group nuclear power study team hopes "to develop a nuclear power reactor within the near futur[e] generate 60,000 kw of electricity at around 7-7½ mills a kwh [a]ccording to Pres Henry B. Sargent of Arizona Public Service, n[u]mber of group. At annual report press meeting last week to introduce company's colorful and unique 1954 annual report, he also revealed sale of water service operations to Arizona Water Co for $3.5 million, thus leaving virtually only electric and gas operations.

International competition and pressures are causing development of nuclear power "more rapidly than our present economic situation would require," Dr Chauncey Starr, director, atomic energy research department, North American Aviation, Inc, told engineering and operating section, Pacific Coast Electrical Association. But, he notes, U. S. prestige is at stake "if we don't maintain our lead." Private utilities have prime motivation, besides economic aspects, to move rapidly, he adds.

More News About People page 36

Senate Unit Hears Upper Colorado Plans

We want to get into the act, UP&L's Moffat tells committee hearing. But we don't want U. S. as competitor, he adds

Ten private utilities in the Colorado area are backing the Administration's plan for development of the hydroelectric potential of the Upper Colorado River Basin in the hope their systems will grow with the billion-dollar project.

Their arguments were presented to Congress last week when David D. Moffat, vice president of one of the participating utilities—Utah Power & Light Co—appeared before a Senate Interior subcommittee airing several plans for the river's future. Moffat said the companies want to get into the act, but made it clear they didn't want the government to compete with them.

Plan to Block Duplication

The utilities want the government to build Glen Canyon and Echo Park Dams, which would have 1 million kw of combined generating capacity. The companies want the government to utilize their existing distribution systems wherever possible. In fact, they're so strong on this point, they've suggested an amendment to pending legislation which would make it impossible for the government to build lines where utilities already have them in. They even plan to build new ones, if their suggestion is accepted, saving the government the expense of putting up duplicating lines.

There's no indication as yet of how favorably the companies' suggestion is being received. In fact, it's still too early to tell how the river development plan is working out in the Congressional mill. There's a lot of opposition, particularly from water-hungry California, which is downstream from the ambitious project. And conservationists and economy-minded Easterners are joining for a showdown fight against even the simplest plan to spend money on the river.

Upper Colorado people are split themselves. A corps of Upper Colorado River Commission enthusiasts is camping in Washington, prepared to stay for several months to lobby their big six-dam plan through Congress. They stand even less of a chance than the Administration, which is asking for authority to build only the two biggest dams.

Power comes in for its knocks, but it's not the only controversial aspect of the program. Being a nonconsumptive use of water, Californians see less danger from the big power plants than from the water-eating irrigation projects which dot the Administration's planned remapping of the area. Although the lower basin people have been using less water each year than they're entitled to under a 30-year-old interstate compact, they're scared to death a sudden pickup in irrigation in the upper basin will cut their supplies too much to allow for lower basin growth in population and industry.

It would cost a lot of money to build the dams, particularly Glen Canyon and Echo Park. The conservationists and Easterners emphasize costs, as well as the flooding out of natural scenic wonders. It would take some time to fill the huge reservoirs behind these dams, and users of Hoover Dam power figure they'd be hard put to keep Hoover pumping firm power while the filling-up process went on. Later on, they apparently wouldn't have this trouble. But on the other hand, they wouldn't be any better off, either.

One of the strongest arguments California is using against Echo Park —which is the most vulnerable part of the Administration program—is that its power would be too expensive. Raymond Matthew, chief engineer of the Colorado River Board of California, claimed Glen Canyon—the biggest dam, situated at the point farthest downstream in the upper basin plan—is the only financially sound power unit in the whole project. He said it would be capable of producing power which could be sold for 4.3 mills per kwhr, but that it's planned to sell at 6 mills to subsidize less-efficient Echo Park and irrigation facilities.

Bill from Committee Due

The Senate hearings are expected to take some time. But some sort of a bill should come out of the committee, with favorable chances of passage in the Senate. On the House side, however, the conservationists are getting together with the politically powerful Californians—who outnumber upper basin Congressmen three or four to one—and Easterners who cannot benefit from the project, and their campaign will probably kill Echo Park, at least. House Interior Committee hearings will start March 9. If a bill gets through the House this year, even without Echo Park, it'll be because there's been a political "deal" made with the Californians, probably over the Central Valley Project.

Here are the other nine Colorado-area utilities: Arizona Public Service Co, Public Service Co of Colorado, Public Service Co of New Mexico, Southern Colorado Power Co, Southern Utah Power Co, Southern Wyoming Utilities Co, Telluride Power Co, Western Colorado Power Co, and Uintah Power & Light Co.

REA Co-ops Submit Expansion Plans

Rural Electrification Administration borrowers have for the first time supplied REA with a five-year forecast of construction. As of now, they plan to build by 1960 at least $841 million worth—an estimate REA thinks is conservative (See Table 1).

REA made a nationwide survey during the last part of 1954. It got such a surprising response—85%—officials have decided to make it an annual task.

REA asked only distribution type borrowers for their construction plans. Then it adjusted figures for estimates for all 991 distribution and power-type borrowers (See Table 2).

Congress' Generosity Key Factor . . . Of the $840 million borrowers plan to spend on construction, they'll need $635 million from REA. Whether they'll get all this depends on Congress' generosity. Whether individual borrowers' needs can be met depends on whether Congress abolishes the state allotment formula restricting REA's ability to distribute its loan funds among states.

The outlook for co-operatives getting their funds this year is good. They think they'll spend about $202 million, of which $156 million would come from REA. REA has estimated it will need $160 million in new loan money during fiscal 1956—just enough.

This doesn't take into account carryover funds from previous authorizations which REA is permitted to spend next year, so there should be a comfortable margin for meeting currently estimated needs, as well as any new co-op demands for cash. Counting carryover, REA should have about $230 million to distribute during fiscal 1956 if its budget request is okayed.

Survey Pleases REA . . . REA officials are pleased with the survey, since the

Table 1 Total Construction Planned by REA Borrowers and Loan Applications To Be Submitted to REA to Cover Planned Construction, Fiscal Years 1956–1960

	1956	1957	1958	1959	1960
	(Millions of Dollars)				
Total Construction Planned	$202	$182	$162	$144	$151
Loan Applications Total	$156	$151	$123	$113	$92
By Purpose:					
Distribution & Other*	59	65	49	45	32
System Improvements	32	36	30	27	17
Generation	42	30	25	25	27
Transmission	18	14	15	12	13
Consumer Facilities	5	6	4	4	3

* "Distribution and Other" includes distribution, substations not a part of system improvements, engineering fees, headquarters, reimbursement of general funds and miscellaneous items not included in other purposes.

Source: 1954 survey of REA borrowers' construction plans and financial requirements. Adjusted to provide 100% coverage and to provide for new power-type borrower requirements.

Table 2

Construction Planned By Distribution Type Borrowers, By States, Fiscal Years 1956–1960*

	1956	1957	1958	1959	1960
	Thousands of Dollars				
United States	$166,207	$149,388	$123,526	$109,368	$116,445
Alabama	7,017	3,273	2,501	3,877	3,657
Arizona	2,355	1,261	1,618	1,618	1,658
Arkansas	5,740	6,323	4,890	4,151	4,217
California	210	115	110	105	105
Colorado	5,530	7,395	3,895	3,100	2,992
Connecticut	—	—	—	—	—
Delaware	307	307	142	218	218
Florida	4,408	3,263	3,216	2,702	3,537
Georgia	6,974	6,156	5,362	4,755	5,032
Idaho	974	349	326	259	1,033
Illinois	3,821	3,006	2,564	3,898	2,808
Indiana	3,484	3,334	2,779	2,469	2,455
Iowa	2,885	2,061	2,173	1,794	1,653
Kansas	3,310	2,375	2,385	1,756	1,813
Kentucky	6,586	5,253	5,531	4,880	5,237
Louisiana	2,880	2,252	2,176	2,473	2,256
Maine	116	368	75	182	46
Maryland	967	1,089	994	924	954
Massachusetts	—	—	—	—	—
Michigan	2,887	1,647	2,049	2,660	2,334
Minnesota	8,769	5,349	5,214	4,697	4,754
Mississippi	5,216	4,547	4,156	4,123	4,350
Missouri	5,151	5,083	4,755	4,422	4,601
Montana	2,373	1,846	1,369	1,573	1,580
Nebraska	4,864	3,828	2,339	2,056	2,057
Nevada	—	—	—	—	—
New Hampshire	553	507	434	415	469
New Jersey	207	78	176	94	140
New Mexico	6,081	8,023	7,041	2,716	7,274
New York	145	129	94	184	169
North Carolina	7,145	5,398	5,252	5,066	5,863
North Dakota	2,388	2,505	2,907	2,541	2,983
Ohio	4,154	2,862	4,405	2,552	3,732
Oklahoma	5,305	4,332	4,324	3,498	3,407
Oregon	900	540	881	544	589
Pennsylvania	2,677	2,359	2,263	2,315	2,193
Rhode Island	—	—	—	—	—
South Carolina	3,418	3,026	2,352	2,298	2,370
South Dakota	2,215	2,335	2,071	1,894	1,914
Tennessee	9,526	7,878	7,767	7,579	7,675
Texas	21,860	23,399	9,859	9,487	8,356
Utah	—	—	—	—	—
Vermont	139	3,434	111	111	172
Virginia	2,834	3,174	3,192	3,153	2,999
Washington	2,682	2,482	2,564	1,703	1,809
West Virginia	69	24	24	38	24
Wisconsin	2,300	1,864	1,486	1,629	1,606
Wyoming	2,517	2,061	3,068	1,564	1,860
Alaska	2,268	2,498	2,636	1,295	1,494

*Note—These data indicate a decline in construction from 1956 to 1959. The decline may reflect inability of the borrowers to forecast accurately all of their requirements for future years rather than in actual decrease in requirements.

1956 projection matches the agency's budget estimate so closely.

The survey also shows:

- Borrowers now have about $122 million of their own general funds tied up in electric facilities.
- They'll connect about 125,000 new customers a year through 1960.
- They expect to invest about one-fourth of their future loans in improving and heavying-up their distribution systems.
- Applications for loans for generation and transmission facilities account for almost one-third of total anticipated loan needs.
- Systems expect to increase their borrowings to finance consumer appliances and equipment under Section 5 of the Rural Electrification Act.

REA officials point out that, since data beyond 1960 was not obtained in this initial survey, needs for 1961 and succeeding years will come in about 1958 or 1959, raising current projections. REA will repeat survey in July to get 1957-1961 figures.

High Court Hears Dispute on Pelton Dam Licensing

The U. S. Supreme Court heard oral arguments last week in the state-federal dispute over licensing of the Pelton Dam project on the Deschutes River in Oregon. Lawyers for the Federal Power Commission and the State of Oregon presented their views on the legal issue of whether states may control the use by the federal government of nonnavigable waters which flow across U. S. lands.

The Ninth Circuit Court of Appeals ruled that Oregon can use its police to block the project, even though FPC licensed the Portland General Electric Co to build and operate the $22-million hydroelectric project.

In challenging FPC's authority to issue the license, Oregon told the Supreme Court that the Desert Land Act of 1877 surrendered to the states regulatory power over nonnavigable waters on arid or semi-arid lands within the public domain.

FPC told the eight justices that the Desert Land Act applies only to public lands, not to areas reserved for power purposes—as is the area around the Deschutes project. The Supreme Court ruling probably will be handed down sometime next month.

Atomic Law Reins Scored

Industry spokesmen at Congressional hearing ask for greater freedom of data to stimulate nuclear power progress

Outstanding spokesmen for both sides of the public-vs-private power question are urging that atomic energy be put on a competitive basis now.

Leland Olds, former chairman of Federal Power Commission under the Democrats, and Francis K. McCune, vice president and general manager of General Electric Co's Atomic Products Division, discussed this issue during the last few days of the current series of hearings before the Joint Congressional Committee on Atomic Energy, which has been looking into the state of the atom under the 1954 revision of the McMahon Act.

Wants TVA-Type Yardstick . . . Olds wants a Tennessee Valley Authority-type atomic power yardstick based on government-owned and operated plants and existing preference provisions of power law.

McCune wants the law fixed so private industry will have the greatest chance to iron out the economic kinks on its own, with as little interference from the government as the law can provide. To create a free atmosphere of this sort, he feels strongly that the Atomic Energy Commission should loosen its hold on nuclear reactor data. Only by having available to it all the hard-won technology in this field can utilities and manufacturers take giant steps toward development of the new energy source as an economical supply, he feels.

Advocates 'Security by Achievement' . . . McCune feels such giant strides by industry are more important in the long run than a tightly run government security program. "Security by achievement, rather than security by secrecy" was the keynote of his argument. He said that no matter how efficient U. S. control of information is, enterprising agents of foreign powers will find ways to pick up information, so that the best way to keep ahead in the international atomic energy race is to give American industry its freedom, and let it outproduce other nations.

McCune and Olds pointed out that one of the most important products of the just-ended hearings is the exposure of the problems which have developed since passage of last year's act, and questions in the minds of American businessmen. Chairman Clinton Anderson (D-N. M.,) agreed, and promised more hearings before the session ends.

Here are some of the problems that harass businessmen the most according to testimony of dozens of witnesses during three-week session.

- Security—Almost every industrial witness before the Joint Committee this year has complained about AEC's reluctance to release important reactor information. Probably the most vigorous of these was James G. Beckerley, until mid-1954 AEC's declassification chief and now consultant to the Schlumberger Well Surveying Co. Beckerley urged that all reactor technology be made available to U. S. industry, except weapons application.
- Patents—The National Association of Manufacturers was most vigorous—but not alone—in its insistence on ending the compulsory licensing features of the 1954 statute. NAM and other business witnesses want industry to exploit privately developed inventions. Otherwise, they warn, one of the most important incentives for atomic development will have gone by the board. As part of their argument, they said too that the 1954 act as written bypasses the basic intent of the patent laws—to give an incentive to inventors.
- Finances—Under the 1954 act, AEC will pay guaranteed prices for plutonium produced in private atomic power plants. However, the guarantee of such prices has only a seven-year life, and industrial witnesses feel this is far too short a time to enable investors to have the security they need to get into an atomic business. They think the guarantee period should be extended to at least ten years.
- Hazards and Insurance—This is a problem which is only now being investigated. A team of insurance executives for the first time is taking a look at AEC's records for safety and AEC's estimates of the hazard potential of the atom in private hands.

now gathering answers for tomorrows' problems

To the problems of insulation for extra-high voltage, multiple conductors add unanswered questions about special hardware. We're busy now gathering experience—laboratory experience—in this extra-high voltage transmission technique, at the Ohio Brass Barberton Laboratory.

Here, men who work daily with insulation *and* hardware investigations are in a unique position to examine the performance of insulator-hardware combinations needed for multiple conductor, extra-high voltage transmission.

Add to this the knowledge O-B development people have gained in the design and installation of multiple conductor lines already in use! Ohio Brass is already rich in knowledge of techniques that may be as much as decades away for commercial extra-high voltage transmission.

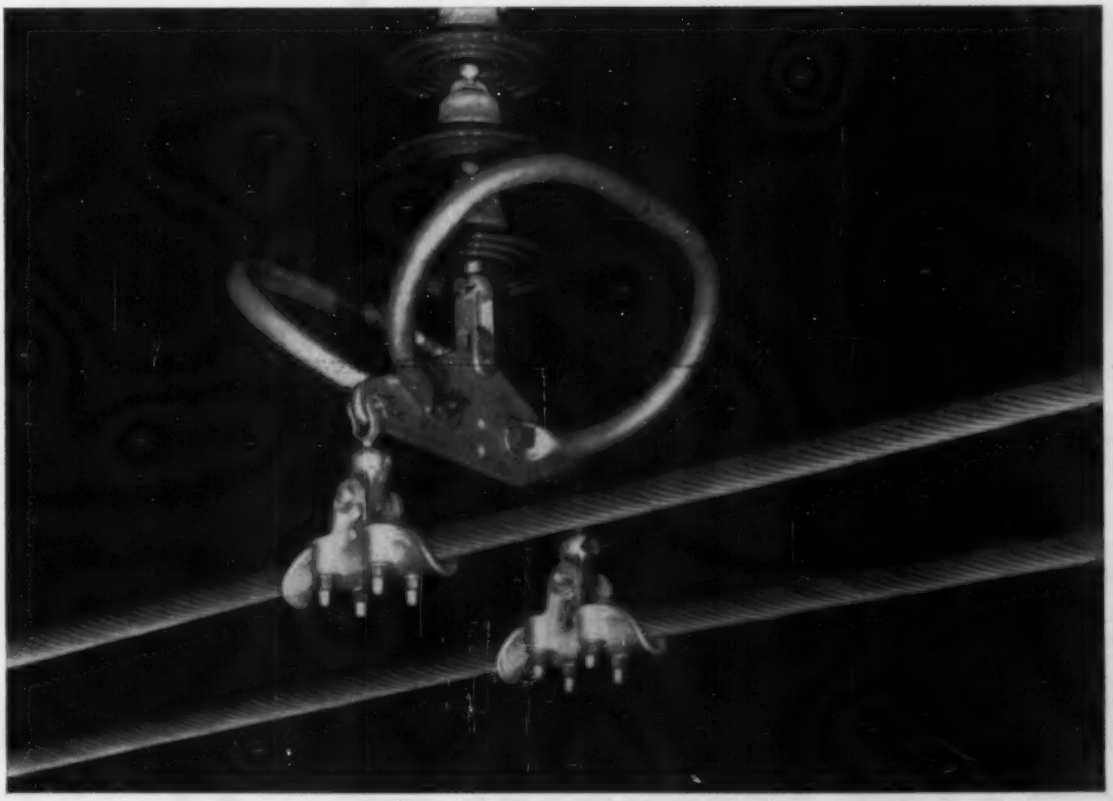
Constant research is a portion of the technical competence that keeps Ohio Brass ready to cope with every new industry problem. This competence can be helpful to any power company now studying EHV possibilities. Call on us!

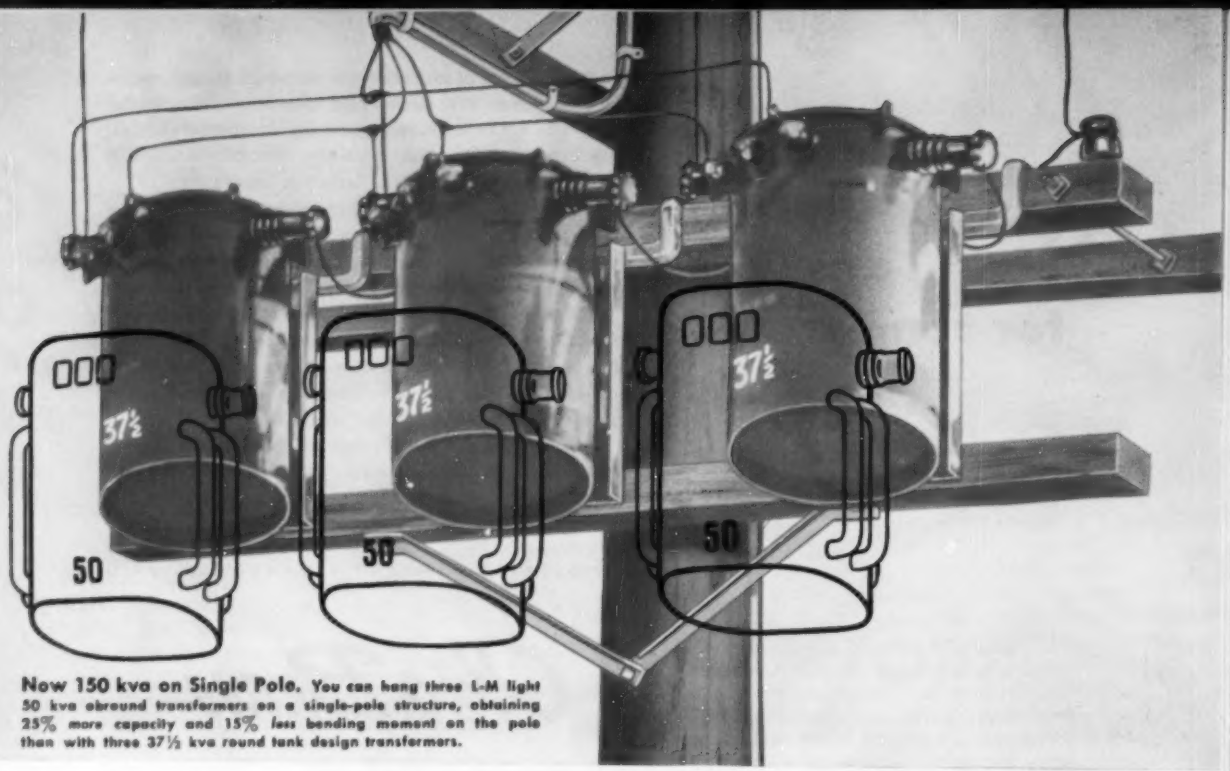
OHIO BRASS COMPANY • MANSFIELD, OHIO

Control rings and associated hardware developed for dual conductors in a 345-kv application. Only Ohio Brass offers an organization adequately equipped to design, produce, and test this equipment for extra-high voltage transmission.

Ohio Brass

4549-M





Now 150 kva on Single Pole. You can hang three L-M light 50 kva obround transformers on a single-pole structure, obtaining 25% more capacity and 15% less bending moment on the pole than with three 37½ kva round tank design transformers.

How L-M Obround Design Provides Additional Capacity On Structures

New obround tank design is smaller, lighter, has shorter moment arm, retaining all outstanding Round-Wound® performance characteristics.

By **ALVIN B. COYLE**
Manager
Transformer Sales
Line Material Company

Now you can hang transformers of larger capacity on a pole structure with L-M's lighter, smaller obround transformer tank design. The additional capacity is obtained without changing outstanding performance characteristics of L-M's Round-Wound design.

Less Weight

The obround design provides a smaller tank with less transformer oil, resulting in a lighter, easier-to-handle transformer. Cooling tubes are installed where necessary to provide the cooling surface for maintaining the same low hot-spot and top oil temperature-performance characteristics found in all other L-M transformers. In addition, the transformer's repetitive overload capacity is improved as the result of the faster transfer of heat from the coils to the cooling air.

Shorter Moment Arm

L-M's new obround design brings the center of gravity closer to the pole, which reduces the moment arm distance from the pole. The combination of lighter weight and less moment arm distance substantially decreases the total bending moment on the pole and crossarms, and thus greatly increases the potential capacity of all your transformer structures.

You can take advantage of savings such as these:

Larger transformers can be hung closer to the top of the pole, eliminating the need for a higher pole and additional spacing.

Single-pole, three-phase transformer structures can now serve more load with the additional transformer capacity available. New 50 kva obround transformers have less bending moment on the pole and on crossarms than previous 37½ kva round tank design. Here L-M's light obround transformers may eliminate the need for costly two-pole structures.

Pole-Mounted 167 kva Transformers

L-M's light-weight 167 kva transformer can be pole-mounted; provides a full 167 kva of capacity on a single-pole structure. And it, too, provides L-M's well-known overload capacity.

To serve three-phase loads you can hang three L-M light 167 kva transformers or 500 kva on a two-pole structure, eliminate expensive platforms, ground pads, or vaults in many instances, and make further use of existing facilities.

L-M's light, obround design transformers are available in single-phase 5 kva through 167 kva in each standard distribution voltage class.

Get Details On Lighter-Weight Obround Transformers

Ask the L-M Field Engineer for application information, weights and dimensions on L-M obround transformers and the exclusive Round-Wound design. Or write Mr. Coyle at Line Material Company, Transformer Division, Zanesville, Ohio (a McGraw Electric Company Division).

LINE MATERIAL *Transformers*

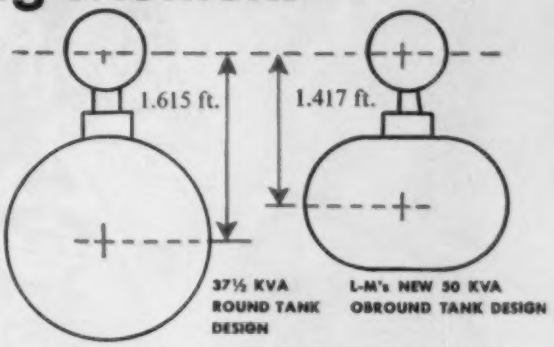
You Can Hang 25% More Capacity With 15% Less Bending Moment

COMPARE 37½ kva round tank design
50 kva L-M obround tank design

37½ kva ROUND tank design:
Moment arm from center of pole. 1.615 ft.
Weight. . . . . 800 lbs.
Bending moment 800 x 1.615. . . . **1292 ft.-lbs.**

50 kva L-M OBROUND tank design:
Moment arm from center of pole. 1.417 ft.
Weight. . . . . 775 lbs.
Bending moment 775 x 1.417. . . . **1098 ft.-lbs.**

L-M's new 50 kva obround transformer has 15% less bending moment than the 37½ kva round tank design.



Less Bending Moment—New obround tank design reduces the moment arm distance from the pole. The combination of lighter weight and smaller moment arm distance greatly decreases the total bending moment on the pole. When crossarm mounted, the lighter weight substantially reduces the bending moment on the crossarms.

Less Weight, Faster Cooling—The obround design affords a small tank and less transformer oil, resulting in a lighter, easier-to-handle transformer. Cooling tubes are installed where required to provide sufficient cooling surface.

In addition, oil ducts, located throughout the coil and between the coil and cruciform cross-section of the wound core, contribute to uniform efficient cooling.

Rapid transfer of heat provides faster cooling of the unit, increasing its repetitive overload capacity.

Plus Outstanding Round-Wound Performance Characteristics

Both the physical and performance characteristics of L-M's obround tank transformer were considered in detail. The advantages of lighter weight and shorter moment arm were accomplished with no sacrifice of outstanding Round-Wound performance characteristics.

Low Exciting Current: the continuously wound core of oriented-grain silicon steel strip provides a uniform flux path, thus permitting low exciting current.

High Impulse Strength: high-voltage windings are on the outside of the coils, providing maximum distance between the high-voltage windings and the core. This permits ample creepage distance with generous insulation.

High Short-Circuit Strength: round coils naturally resist radial short-circuit forces without damage or distortion. Sturdy core clamps and strong blocking aid in preventing axial movement of the windings under short-circuit conditions.

High Short-Time Overload Capacity: cruciform cross section of wound core and ducts between windings and layers provide excellent cooling for the entire unit.

Now you can hang 167 kva directly on the pole, yet L-M's new lightweight obround has full 167 kva continuous rating and no sacrifice in overload capacity.

LINE MATERIAL

LM Transformers

Adequate Wiring? FIDDLESTICKS!

This is the old Abernathy place. It was the talk of the town when it was built in 1881. People used to come from miles around just to have a look at it.

The old couple that lives here had the place wired for electricity in 1926. If you were to ask them about adequate wiring, they might say "Adequate wiring? Fiddlesticks! All we ever use are the lights in the kitchen and the parlor and a light in the upstairs hall. Reckon we're adequately wired for that!"

They're probably right too...

But chances are, your company doesn't have many customers like this. Many of your customers probably now have or soon will have 100 amp service entrances in their homes. And a 100 amp service entrance is the cornerstone of adequate wiring.

A home equipped with a 100 amp service entrance calls for a 100 amp capacity watthour meter.

J2 Adequate Meters for Adequate Wiring

- **The 100 ampere, slow-speed meter.**
- **Proven by a year's service.**

THE FIRST WATTHOUR METER WITH

STRAIGHT LINE ACCURACY UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM55-3

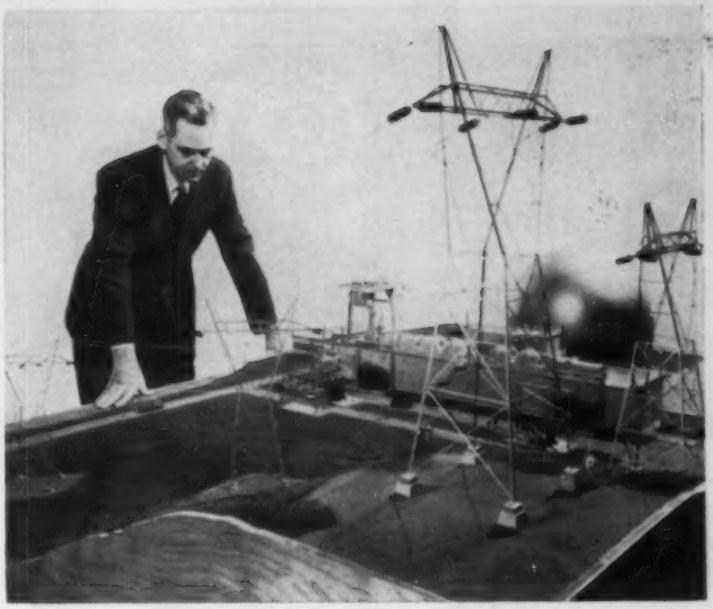
Memphis Seeks Permit to Build Power Plant

Memphis, Tenn., has taken another step toward the threatened action of building a steam generating plant to compete with the proposed Dixon-Yates plant.

The Memphis state representative, James J. Bertucci, has introduced in the legislature a bill to empower Memphis to build its own power plant and sell power to Tennessee Valley Authority.

Although the bill is aimed specificaly at permitting Memphis to sell power to TVA, it would amend the 1935 municipal revenue bond law to authorize any Tennessee city to build its own plant and do the same thing. The amendment says any such project could be leased, or operated and maintained "either wholly or partially for use and benefit of the United States, the State of Tennessee or any agency or instrumentality" of those governments. TVA, a governmental corporation, is an instrumentality of the federal government.

The legislation follows threats by Memphis' Mayor Tobey and other officials to "secede" from TVA rather than draw power from the Dixon-Yates plant.



GE's Atomic Power Plant Model

General Electric Co placed its model of a future atomic power plant (pictured above) on display in the Department of Commerce building as part of a general atomic energy exhibit. Francis K. McCune, vice president and general manager of GE's Atomic Products Division, is seen inspecting the model. McCune has predicted that economic electric power could be produced in atomic plants "possibly within five, certainly within ten years."

WASHINGTON CHECKLIST

Southwest Power — Pattern-setting Southwestern Power Administration contract in Missouri has integration feature. Northwest Electric Power Cooperative, Inc, will buy SPA power, then sell to Kansas City Power & Light Co. Deal, soon to be signed, is similar to G&T co-op-Texas Power & Light Co arrangement, but is new for Missouri area.

Southeast Power—Comptroller General is not satisfied by Interior Department—Federal Power Commission-Army Corps of Engineers cost allocation agreement. In recent audit report on Southeastern Power Administration, the government auditor complained there's no authority to say who should allocate project costs. He thinks it should be handled in legislation.

Appropriations — Newly organized Senate Appropriations subcommittee on public works has been divided into three panels to consider funds for (1) Army civil functions, (2) Atomic Energy Commission and Tennessee Valley Authority and (3) Interior power agencies. House Public Works subcommittee may follow suit.

Federal Power Commission—FPC has consolidated its divisions of rates and gas certificates in its new Bureau of Rates and Gas Certificates. It's transferred accountants who regularly work on rate cases from the office of chief accountant to the new bureau. The new bureau and the chief accountant's office were set up Feb. 1 to replace the commission's old Bureau of Accounts, Finance, and Rates.

Conservation—"Trustees for Conservation," incorporated in California in November, 1954, will carry on lobbying activities of Sierra Club of San Francisco during 84th Congress.

Atomic Energy—Research and development subcommittee of Joint Congressional Atomic Energy Committee asked Department of Defense for detailed top policy statement of plans of all services for use of atomic energy in all fields other than weapons. The Defense Department outlined these in a closed session March 9.

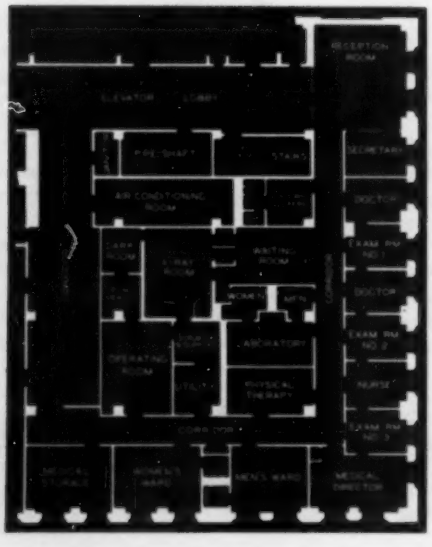
Rural Electrification Administration—The Hoover Commission's report on lending agencies, originally due in Congress last week, has been delayed because of a printing office logjam. A commission task force recommends the abolition of REA in favor of a bond-financed lending corporation.

Bills Introduced:

Hells Canyon—To authorize federal high dam, (S 1333) (Bill by Sen Wayne Morse (D-Ore.) has 29 sponsors).

Kansas City P&L Employees Find . . .

New Clinic Offers Complete Service



When Kansas City Power & Light Co made plans for modernization of its headquarters building, employee health and welfare were uppermost in the minds of the planners. A modern medical clinic was an important part of the program.

This concept reflected the philosophy expressed by Pres H. B. Munsell that "maintaining and improving the health of all employees is a matter of deep concern to company management."

The clinic will provide modern facilities for comprehensive medical examinations, treatment, and advice. It will make available to employees a number of services in addition to the customary examination of applicants for employment, care of on-the-job injuries, and care of cases under workmen's compensation.

Some of these added services include special periodic health examinations for all employees, assistance in rehabilitation of disabled employees, and provision for health education throughout the company.

Diagnosis treatment and consultation will be provided for employees referred to the clinic by department heads where attention will enable employee to remain at work.

Three cheerful examination rooms are available

Sterilization is mandatory for all instruments

Operating room provides emergency treatment

Medical laboratory is equipped to make any test

Which Twin Will Become a Meterman?

When Consumers Power Co opened up its new General Meter Building in Jackson, Mich., for employees to inspect, Meterman David Meerman brought his twin sons along to get a look at "what daddy does." Todd showed an inclination toward becoming a meterman by picking up a screw driver and trying his hand at the job while brother Ryan looked on.

More than 1,500 workers and members of their families turned out to see how meters are received, cleaned, inspected, repaired, tested, and shipped. The new building centralizes the company's meter test and repair activity for its 64-county service area, formerly undertaken in 16 different cities. More than 3,000 persons from the Jackson area also toured the building during a two-day open house program for the public.

NW Power Group Proposes 4-State Columbia Compact

States ultimately would be able to acquire power plants and other developments from the proposed Columbia River Development Corp, under a third draft of a proposed regional power-corporation bill now being circulated by the Northwest Public Power Association, preparatory to introduction in Congress.

Changes continue to be made and a fourth draft will be considered by the association at its annual meeting April 20-22 in Eugene, Ore., according to Gus Norwood, association manager.

Washington, Oregon, Idaho and Montana would be authorized to form a compact to take over the corporation's facilities. This compact, which would have to be approved by the state legislatures and by Congress, would be much more comprehensive than a compact recently developed by a seven-state commission and now before the various legislatures (EW, Jan. 31, p44). The commission proposed under the seven-state compact would be only an advisory group, while that proposed under the four-state compact could take definite action.

The regional power-corporation bill is modeled upon the Eisenhower Administration's St. Lawrence Seaway law, the corporation to be controlled by a five-man board named by the President. Revenue bonds of the corporation could be purchased by the federal government.

The corporation would take the place of the Bonneville Power Administration, acquiring that federal development's facilities at the "net cost to the federal government." It would be empowered to issue 50-year electric revenue bonds to build generation units and transmission lines. The Army Corps of Engineers and the Bureau of Reclamation would continue to construct dams, with financing by the corporation.

Arkansas' Faubus Signs Utility Territory Bill

Arkansas' Gov Orval E. Faubus has signed into law a bill embodying compromises worked out by Arkansas Power & Light Co and co-operatives on the controversial private-public power dispute on territory allocation.

House Bill 77, now known as Act 85, clarifies the law on allocation of territory, specifically co-operative territory annexed by a municipality. The original bill said co-ops could keep any territory they ever had. However, under the compromise co-ops serving municipalities of less than 2,500 continue serving when population exceeds 2,500. But when co-op territory is annexed to municipality served by private utility, the private utility gets it but must compensate the co-op.

Worked on Compromises . . . This compromise and another compromise legalizing construction of co-op generating plant (HB 76, now Act 32) were drawn up by utility committee headed by Pres R. E. Ritchie and Board Chairman C. Hamilton Moses of Arkansas Power & Light, and co-op committee headed by attorney John R. Thompson and Pres Harry L. Oswald of Arkansas State Electric Cooperatives, Inc. Both sides say the new law is not aimed at any particular situation, but will facilitate handling of several current situations.

T. E. Bostic of Forrest City, manager of Woodruff Electric Cooperative Corp and chairman of co-ops legislative committee, said, "We feel we have a bill we can live with, but we are not overjoyed with it." AP&L said all comment would be withheld till legislature adjourns this month.

House Bill 50 giving Public Service Commission certain authority over utility advertising was defeated 26-4 by the Senate. It is not expected to be called up again this session.

VICTOR "KNOW-HOW"

Plus

Purified Porcelain

...Give You America's Finest Pintypes!

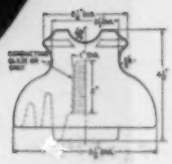
VICTOR Low Voltage Pintypes are the result of the combined "know-how" acquired through ceramic, electrical and mechanical research.

VICTOR Pintypes are made of *Purified* Porcelain, finest insulator porcelain ever made! They are designed with rugged cross section for maximum strength and resistance to impact. They have large-radius top and side wire grooves to permit use of new larger conductors, and smooth hard glaze for maximum self-cleaning in contaminated areas. Every insulator is thoroughly tested to assure continuity of service.

VICTOR Pintypes last longer, cut line maintenance costs to a minimum. You'll save money by specifying VICTOR.

FEATURES

1. **PURIFIED PORCELAIN** provides highest dielectric and physical strength.
2. **RUGGED CROSS SECTION** gives maximum strength and resistance to impact.
3. **RESEARCH-ENGINEERED DESIGN** minimizes outages.
4. **LARGE-RADIUS TOP AND SIDE WIRE GROOVES** permit use of new larger conductors.
5. **MECHANICALLY APPLIED GLAZE** results in high strength with smooth, self-cleaning surface.
6. **ACCURATE PINHOLE GAUGING** —every lot must pass NEMA standards for pinhole thread accuracy.
7. **ROUTINE ELECTRICAL FLASHOVER TEST** is given every pintype before shipment.



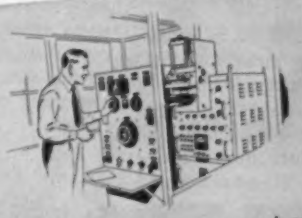
Specifications

60 cycle Dry Flashover	70 KV
60 cycle Wet Flashover	40 KV
Pos. Impulse Flashover*	110 KV
Neg. Impulse Flashover*	140 KV
Dry Arcing Distance	5"
Leakage Distance	9"
Rec. pin height	5"
Cantilever Strength	3000 lbs.
Low Freq. Puncture Voltage	95 KV
RNI (plain)	5500 microvolts
RNI (radio-freed)	50 microvolts
1000 KC at applied KV	10 KV

*Crest KV. 1½ x 40 microsecond wave Critical Value

For the full facts on Victor "Know-how", write for "The Story of Victor and Purified Porcelain." For engineering data on Victor insulators, write for Bulletin No. 4.

NEWS FROM VICTOR



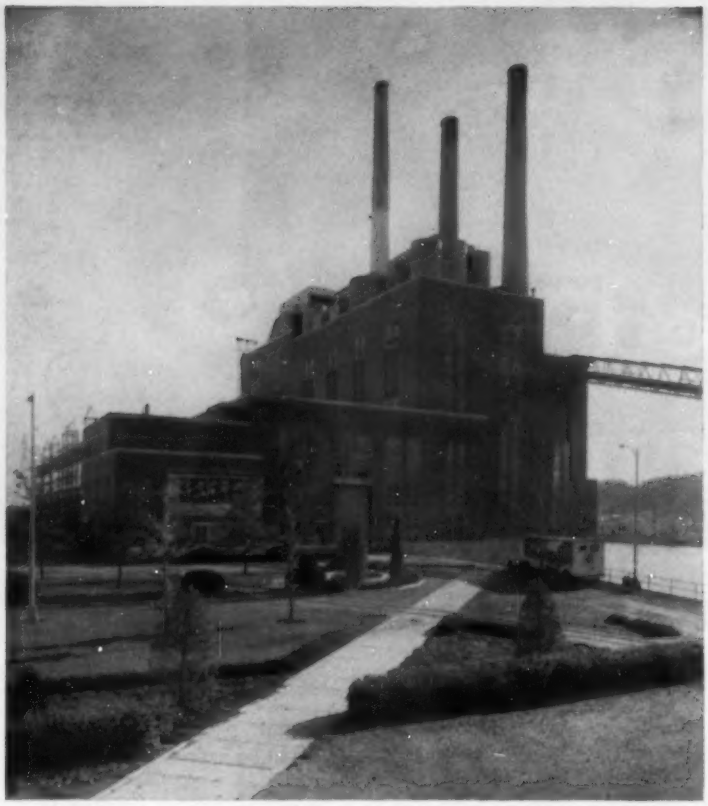
Shown in the drawing above are the control panel and Oscillograph for the impulse generator in the Victor electrical laboratory. This equipment is being used to study the effects of high surge voltages on both present and projected insulator designs.

SPECIFY VICTOR

Purified Porcelain Pintypes

VICTOR INSULATORS DIVISION
I-T-E CIRCUIT BREAKER CO.
VICTOR, N. Y.

Low and High Voltage Pintypes • Suspensions • Guy Strains
Spools • Switch and Bus Insulators • Custom Designed Porcelain Insulator Hardware



Beckjord Station Wins 2nd Beauty Award

Cincinnati Gas & Electric Co's Beckjord's Station has captured its second award for the beauty of its exterior and surrounding grounds since formal dedication in June, 1952. Its latest award came last month from the American Association of Nurserymen for Industrial Landscaping for 1954. The photograph shown above shows some of the landscaping in the foreground.

Landscaping at the Beckjord Station includes a large meadow of 30 acres developed into a park area between the buildings and U. S. 52, which has been planted with a variety of native shrubs and flowering trees.

Beckjord Station was the winner in 1953 in the New Planting Division of the Fourth Annual "Beautification In Industry" contest conducted by Garden Center of Greater Cincinnati.

Atomic Progress Talks Set for West Coast Parley

Theme of the first West Coast conference on applied industrial uses of atomic energy will be "Atomic Energy—The New Frontier." The meeting, which is expected to attract more than 500 industrial leaders, is scheduled for April 4-5 at Mark Hopkins Hotel in San Francisco.

Atomic Industrial Forum, Inc, New York, and Stanford (Calif.) Research Institute will jointly sponsor the atomic energy conference on industrial uses.

Subjects to be covered in discussions at the two-day meeting are: (1) Recent progress in development of nuclear power plants, (2) potential uses of nuclear reactors for industrial research and production of process heat and radiation, (3) products and services required by an expanding atomic energy industry, and (4) ramifications of atomic energy in such related fields as finance, insurance, and education.

Direct inquiries to AIF, 260 Madison Ave., N. Y., or SRI at Stanford, Calif.

Priest Rapids Dam

Gov Langlie offers to aid Grant County PUD in its plans to build $375-million project

With Washington State Power Commission's hopes of building Priest Rapids Dam on the Columbia River having been dashed by an adverse court decision, Gov Arthur B. Langlie declared he would assist the Grant County PUD in its plans to build the $375-million project.

He repeated his belief that the PUD would encounter "problems that will be very difficult to solve" and that the commission was the logical agency to build the dam but, in view of the state supreme court's decision that the commission could not interfere with the PUD's plans, concluded that "the only thing to do is to work out a program to expedite the project every possible way."

In a related move, Langlie called representatives of public and private power to a meeting in his office and reported later that "some progress" had been made in reconciling their views on power policies. He also announced that the state would support the Army Corps of Engineers' budget request for funds to prepare plans for John Day Dam on the Columbia between McNary and The Dalles Dams.

Langlie would prefer to have the John Day project built under a partnership agreement but, if too much opposition develops to such a proposal, he will favor having the dam constructed by the federal government, he declared.

"The important thing is that the Pacific Northwest must have some new starts in the near future in order to meet the power shortage that is projected for the winter of 1961-62," Langlie said. "Since it takes six to seven years to engineer and construct one of these major projects, it seems obvious that it will be necessary to get something under way soon."

Ft Randall Adds 5th Unit

Fifth 40,000-kw generating unit has gone on the line at Fort Randall Dam in South Dakota a month ahead of schedule. Dam now produces 200,000 kw. Ultimate capacity is slated to be 320,000 kw.

ROEBLING PAPER POWER CABLE WITH TELLURIUM LEAD ALLOY SHEATH

YOU WANT

- *EXTRA FATIGUE RESISTANCE,*

PLUS

- *LOWEST LONG-TIME CREEP RATE,*
- *HIGH BURSTING STRENGTH,*
- *TOP STABILITY UNDER HEAT,*
- *ABOLITION OF FREQUENT STOP JOINTS OR REINFORCED LEAD SHEATH,*
- *ABOLITION OF NEED FOR GENEROUS EXPANSION BENDS OR LARGE MANHOLES...*
- *THE DEPENDABILITY ASSURED BY OUR EXCLUSIVE MANUFACTURING, TESTING AND FIELD EXPERIENCE...*

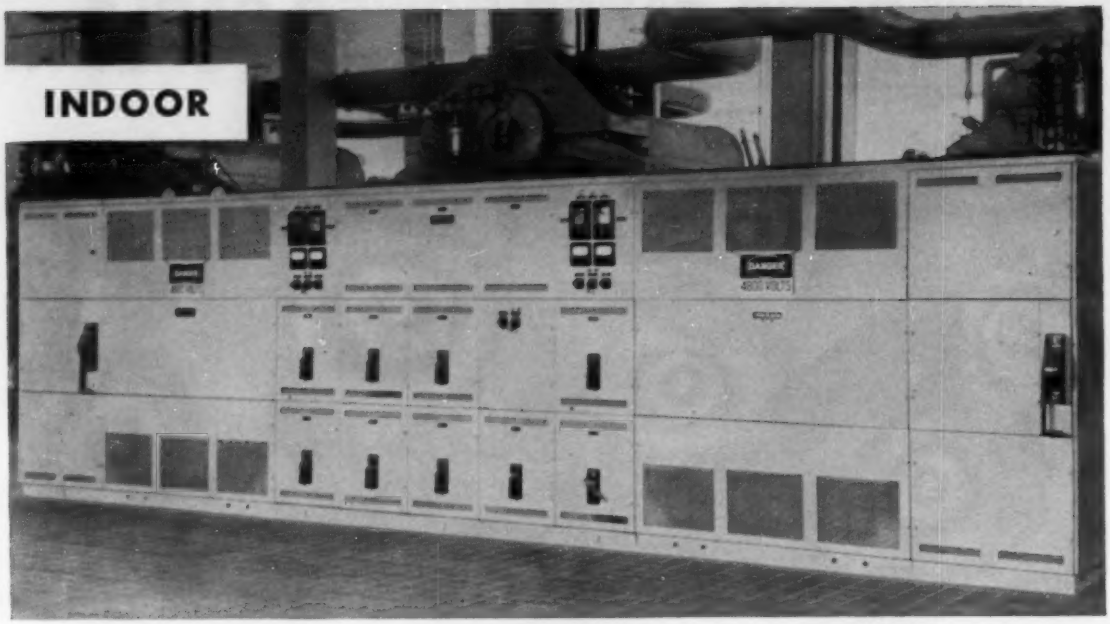
IN SHORT,

YOU WANT

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

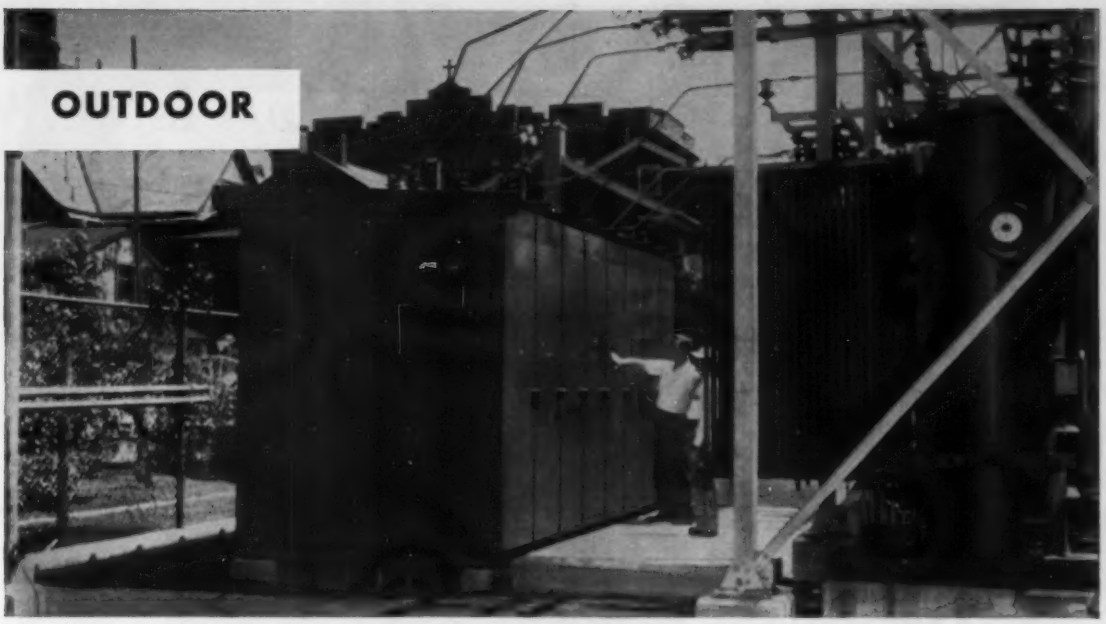
JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6316 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.



I-T-E, SINGLE SOURCE OF SUPPLY

Primary Section: Maximum protection on the primary side is assured with I-T-E Power Air Circuit Breakers. As an alternate to circuit breakers, roof bushings, throats, terminal chambers, oil cutouts, liquid disconnect switches or air interrupter switches may be furnished.

Transformer Section: I-T-E can supply any type of transformer required for a particular installation. It can be either liquid filled, nitrogen sealed, or dry type. All transformers match and line up with the primary and secondary sections to create one complete unit.



FOR COMPLETE UNIT SUBSTATIONS

Secondary Section: The secondary section consists of I-T-E switchgear. Completely interchangeable, horizontal drawout air circuit breakers are housed in a sturdy structure with completely isolated compartments, large rigidly braced bus, and a superior exterior finish.

You can buy a unit substation either of two ways: a piece at a time (the expensive way), or all at once (the economical way). I-T-E can sell you the individual elements, but recommends that substations be purchased complete, and from a single source of supply.

There are good, practical reasons for this. I-T-E's engineering assistance in over-all planning, floor layout, and choice of elements is more valuable to you when it covers the complete substation. Units are packaged and shipped ready to install without delay or complications.

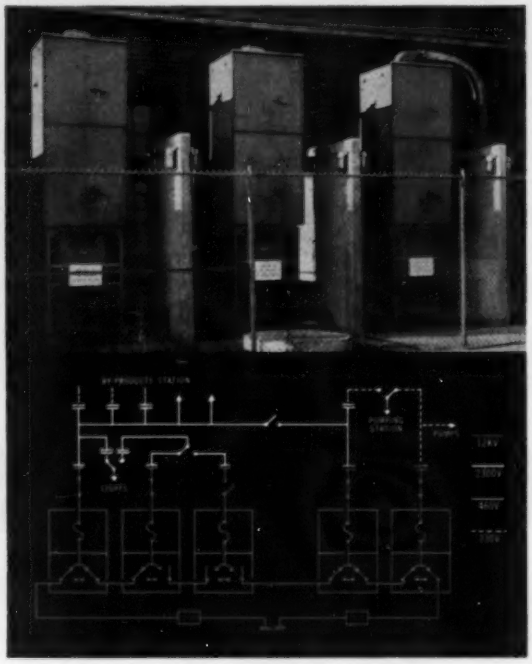
There are further advantages in knowing that one dependable company stands behind your complete installation, and that all parts are designed to function as a unit.

I-T-E Primary and Secondary Unit Substations can be supplied for any application: indoor and outdoor, and in any standard rating. For details, contact the I-T-E sales office nearest you. Look in your classified directory under "Electric Equipment." I-T-E Circuit Breaker Company, Switchgear Division, 19th & Hamilton Sts., Philadelphia 30, Pennsylvania.

I-T-E CIRCUIT BREAKER COMPANY
Switchgear Division

Greater FLEXIBILITY at a Lower Cost

A large gas plant saved thousands of dollars by using G & W Type "RAL-SC" Switch Fuse Units as primary switchgear!



Where power failure might disrupt essential service to thousands of gas consumers, Type "RAL-SC" switch fuse units were used to connect two electric utility feeders in a 12 Kv. loop supplying five 1500 Kva. transformers and one 450 Kva. transformer.

The diagram shows the system layout which provides alternate power to the various loads operating at 2300, 460 and 230 volts.

Each of the 12000/2300 volt transformers can be connected through an "RAL" oil switch to either of the two utility feeders. Fuse protection for each transformer is furnished by Type "SM" power fuses located in the middle cabinets above the "RAL" oil switches. Isolating disconnects are in the top cabinets above the fuses.

The "RAL-SC" units are fully enclosed in welded steel compartments installed outdoors. Operating shafts of the "RAL" switches extend back through the building wall and are operated from the inside. Cabinets are interlocked with the oil switches so the fuse enclosures cannot be opened when either feeder is connected to the load circuit.

Send an outline of your switch-fuse problems for G & W recommendations.

G&W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois, U.S.A.
Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

D544

Mutual Aid Pact Endorsed by PEA

Experience with Emergency Assistance Roster during Hurricane Hazel proved successful, but Pennsylvania Electric Association T&D group urges extension

The Emergency Assistance Roster (an agreement to provide mutual aid in emergencies) has been enthusiastically approved by the Transmission and Distribution Committee of the Pennsylvania Electric Association. The endorsement was made at the Feb. 10-11 meeting at Pittsburgh. The EAR is comprised of all electric utilities in Pennsylvania, New Jersey, and Delaware and some in New York and Maryland.

Hurricane Hazel provided the most recent proof of the roster's value, asserted D. A. Campbell, Jr, Pennsylvania Power & Light Co, although the few members which escaped the hurricane were unable to meet the needs for assistance. Delays in reaching "right men" in outside companies resulting from the lack of roster-like information prompted Campbell to advocate expansion of the roster. An alternative would be to promote similar rosters in adjoining states with provision for mutual assistance between rosters.

Experience over the years the roster has functioned has shown that a simple plan can prove entirely adequate, said Campbell. In its present form it consists mainly of a listing of a few executives in each of the 20 member companies who have been authorized to dispatch emergency assistance. Many smaller utilities through representation by larger neighbors are considered in every way participants in the plan. Provision is made also for power plant disasters by listing contacts in the power production field.

Basic understanding in the unwritten agreement, Campbell explained, is that no member aims to profit at the expense of an unfortunate neighbor. Reimbursement for assistance covers only the actual cost.

The first principle in restoration of service by a stricken utility, stated C. W. Cornforth, Public Service Electric & Gas Co, is subdivision of territory into areas small enough for supervisors to keep track of the work. Restoration demands close personal supervision. Large areas may encompass too much work for one man to direct effectively.

The second, he continued, is balanced organization in each restoration area. Men must be provided to scout the trouble, clear away hazards, switch, and make repairs.

The third is to intercept customer calls allowing only those which provide helpful information to reach the restoration area forces. Other calls are recorded but not permitted to block essential operations.

Briefs from Other PEA Engineering Meetings

Electrical Equipment Committee

Philadelphia, Feb. 17-18

Breakers having an interrupting rating of 100 million kva will be required on utility systems by 1965. In developing them, manufacturers would be aided if utilities would establish standard breaker ratings—K. G. Darrow, General Electric Co. There is justifiable concern over some methods of testing breaker interrupters. Field testing provides best data—D. M. Umphrey, Federal Pacific Electric Co. However no system facilities are available to rest even the 25-million-kva breakers being built—J. W. Stirling, Westinghouse Electric Corp. In working toward these new higher breaker ratings, basic fundamentals of physics and engineering, rather than elaborate schemes, are providing the best breaker mechanisms—A. K. Hamer, Allis-Chalmers Manufacturing Co.

Air-break switches using the explosion gas principle or fitted with interrupting chambers perform better than horn-gap type for switching network or parallel load currents. This has been revealed by tests made by Pennsylvania Power & Light Co. Company specifications for horn gap switches now require that they prove ability to open and close when coated with 1-in. clear bubble-free ice built up at the rate of ¼ in. per hr at 25F—W. R. Smith, Pennsylvania Power & Light.

Shop reconditioning of power transformers has let Duquesne Light Co lengthen inspection time from once in 4 to once in 8 years. Relocation of tap changing equipment to accessible locations has been a by-product of the program—Y. Nelson, Duquesne Light.

Relay Committee

Pittsburgh, Feb. 15-16

Relay problems can be simplified if only essential auxiliaries are transferred after a generating unit is tripped. Where inrush and sequencing are problems, step-type or double-inverse characteristic relays are particularly useful —V. A. Nosko, Cleveland Electric Illuminating Co.

Large 2,400-v motors at Elrama Station are protected with long-time overcurrent relays having instantaneous elements. The same type relay is used to protect large 460-v motors. It has been well coordinated with DB-15 breakers

(*Continued on page* 27)

SAVE DOLLARS!

with BLACKBURN

low-cost, one-piece CAST LUGS

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Multimount Lugs

Three types to choose from . . . a lug for every job—Multimount, Twin and Single lugs.

Rugged, durable construction eliminates stripped threads. Machined tangs, chemically treated, insure low surface resistance. Compact design with rounded edges to prevent wire damage and abrasions. Your choice of screws—socket or hex head—at no extra cost. Plated to your specifications if desired—silver, tin or cadmium. Special drilling available on Multimount and Twin Lugs.

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SEND FOR LATEST LUG BULLETIN CONTAINING PRICES AND SPECIFICATIONS

Briefs from PEA Meetings

(*Continued from page 25*)

protecting transformers supplying 460-v service—J. L. Koepfinger, Duquesne Light Co.

Overcurrent relays are used at Cromby Station also for large motor protection because the motors are fed from a 4-kv grounded-wye system. Originally delay elements were set at minimum, but because of repeated tripping of some motors on starting, settings were increased from ½ to 1 amp—C. B. Woodward, Philadelphia Electric Co.

No time delay is used at Sunbury Station in transferring auxiliaries from normal supply to standby during emergencies. Tests showed that 17 cycles after opening the supply source breaker, residual voltage is 50% of bus voltage and 180 deg out of phase. At 24 cycles voltage is 25% and back in phase. At 38 cycles voltage is zero—W. F. Mackenzie, Pennsylvania Power & Light Co.

Capacitor-type bushing potential devices, as a source of potential for relaying and metering, give satisfactory service if accuracy isn't important and secondary burden isn't too large. Moreover, they are more economical than potential transformers in ratings of 69 kv and up—F. D. Johnson, Westinghouse Electric Corp.

Small phase-angle deviation and good voltage regulation can be obtained when using an aperiodic line coupling unit as a capacitor potential device. In addition, it has excellent mechanical characteristics. A 345-kv unit, 13 ft high, can withstand a tangential force of 1,200 lb—L. G. Walker, Motorola, Inc.

Capacitor-type bushing potential devices, properly adjusted and applied, provide an economic source of voltage for relays and instruments. However, accuracy is adversely affected by changes in secondary burden. Use a vacuum-type voltmeter for voltage calibration, a cathode ray oscilloscope for phase-angle calibration—W. F. Mackenzie, Pennsylvania Power & Light Co.

Swing impedance curves determined by ac board studies have let South Penn Power Co check its relay settings. It found relays on older lines that were set without an ac board study to be set correctly. Therefore its engineers believe board studies are not needed to set directional phase comparison relays. But they do help when load conditions are unusual—C. Morrison, South Penn Power.

Prime Movers Committee

Pittsburgh, Feb. 14-15

Best way to detect cracking in welded pipes of austenitic material is with a penetrating red dye. A template showing results of the examination can be made when this method is used. Cracking will often occur if sharp changes in direction are made when welding austenitic material. One welding practice followed with this material calls for no preheating of weld and rapid air cooling after heat treatment—H. M. Solden, Public Service Electric & Gas Co.

Over 8,000 joints have to be made in a modern steam generator made of steel ranging in type from carbon to special alloys. Most joints are made with conventional butt welds and backing rings. But with small-diameter tubes backing rings can't be used. One solution is to fuse tube ends with an arc process—D. H. Corey, Detroit Edison Co.

To become a first class welder at Philadelphia Electric Co, it takes a minimum of 47 months of training and experience. This includes 6 months probation, 27 months as a helper, and 14 months as welder in training—J. F. O'Malley, Philadelphia Electric Co.

Pipe welds are heat treated by Detroit Edison Co with heat from a hand torch burning propane gas . . . Philadelphia Electric Co uses Nichrome wire insulated with ceramic beads for pipe heat treatment. An arc welding machine supplies power to the wire which is wrapped around the pipe near the weld—From floor discussions.

Atomic Waste Disposal Worked Out by British

LONDON (McGraw-Hill World News)—Special procedures for dumping wastes from nuclear energy plants have been worked out by Britain's Atomic Energy Establishment at Harwell. First step is to reduce them by heat treatment into a non-water soluble calcined form, after which they are stored in corrosion resistant containers.

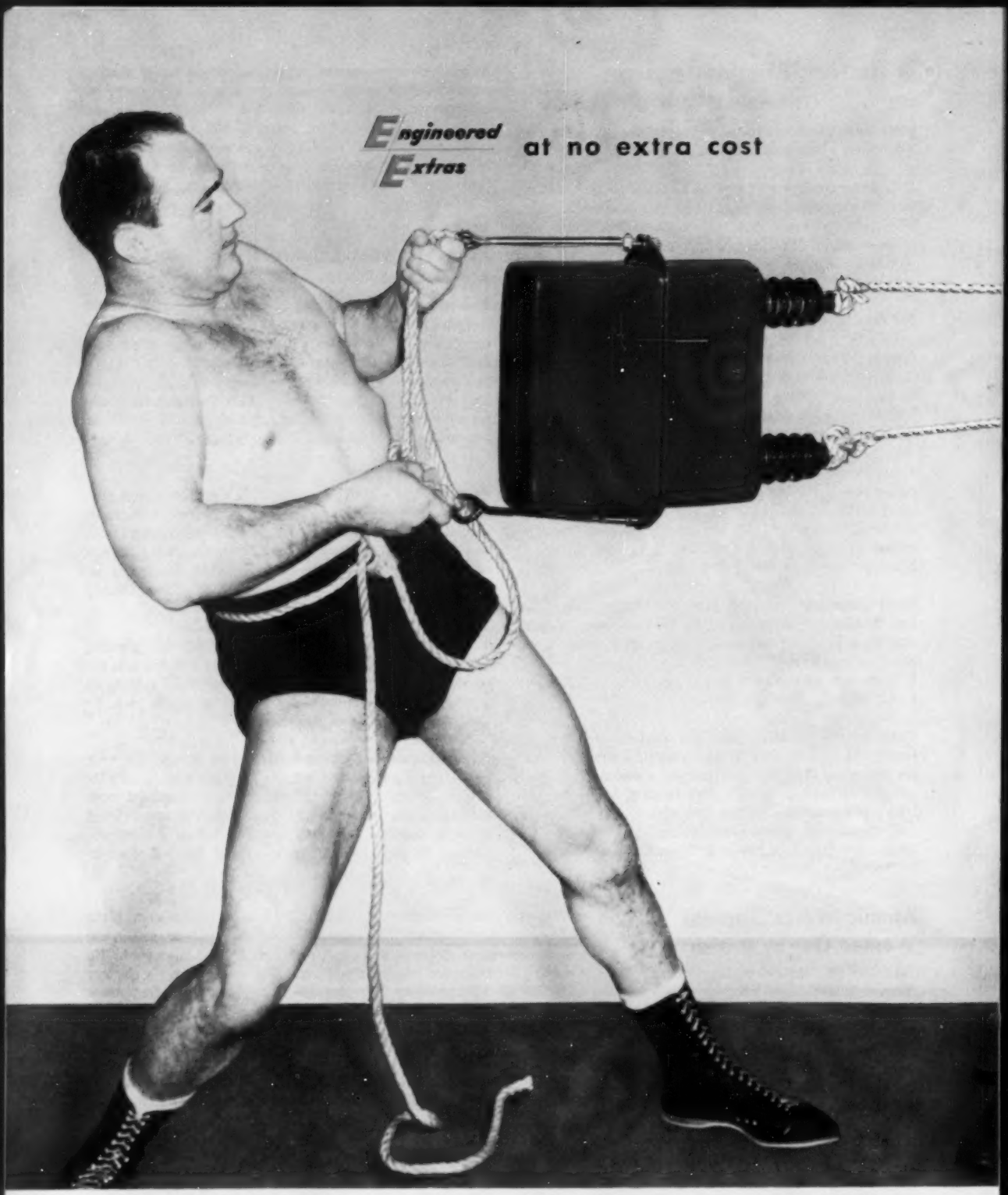
The first step of course is to separate the various radioisotopes according to their effective half-lives. Those with short half lives don't require anywhere near such specialized containers as those which remain dangerous for many years. One advantage gained from the calcining heat treatment is a substantial reduction in volume, thus simplifying the operation. Some of the reduced waste will be dumped into the ocean, some stored underground.

AIEE Heating Conference Opens May 10 in Chicago

Industrial heating will be discussed at a conference in Chicago May 10 and 11 sponsored by the committee on electric heating of the American Institute of Electrical Engineers.

Dr Hubert N. Alyea, professor of chemistry at Princeton University, will deliver the banquet address "Atomic Energy—Weapon for Peace." He will discuss the subject beginning with the Middle-Age alchemists' interest in the transmutation of lead into gold. He will trace atomic energy's history through nuclear reactors for power production.

Papers presented at the two-day conference will be bound in book form and given each registrant. Subjects will include: Furnace brazing, a new method of brazing aluminum and magnesium, unusual applications of the salt bath furnace, radiant heating, vacuum melting, 60-cycle induction core-type induction melting furnaces, metal sheath resistor type heating, dual frequency heating for forgings, induction heating for automatic forging, scale model testing, high frequency resistance heating, and dielectric heating.



TITANIC TUG-O'-WAR pits famous TV wrestling stars **Vern Gagne** (left) and **Yukon Eric** against sturdy General Electric capacitor to prove strength of superior G-E bushing construction.

GENERAL ELECTRIC

World's strongest capacitor bushings?

Dramatic test proves strength of unique G-E welded and soldered, cast-in-glass construction

G-E capacitor bushings are built to "take it." You needn't worry about rough handling pulling these bushings loose or breaking the hermetic seal.

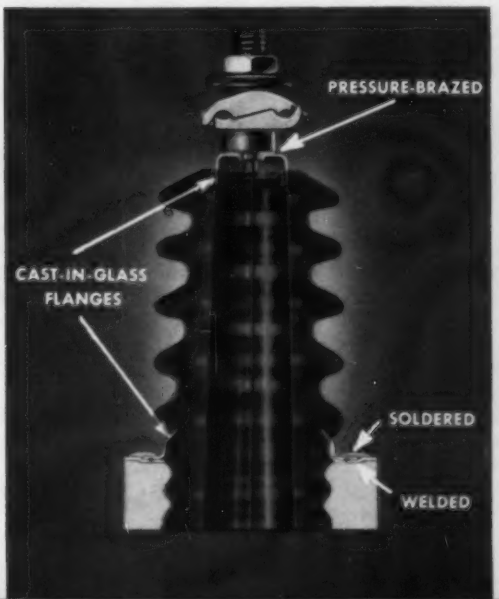
This extra strength means G-E capacitors will last longer in service, too. Here's why: All capacitors expand and contract with temperature variations, producing considerable stresses around the bushings. Unless bushings are very securely attached, these stresses are liable to cause loosening after several years of service. This would allow the impregnant to leak out, and moisture and air to enter the case, ultimately causing failure.

G-E bushings are made out of a specially compounded, low-expansion glass. Metal flanges with the same coefficient of expansion as the glass are integrally cast into the molten glass during manufacture. These flanges are then *welded to the capacitor case for mechanical strength, and then hermetically sealed with solder.* This unique General Electric manufacturing process produces a positive, air-tight, moisture-tight seal, so essential in the construction of a good capacitor. No other make of capacitor has welded and soldered cast-glass bushings.

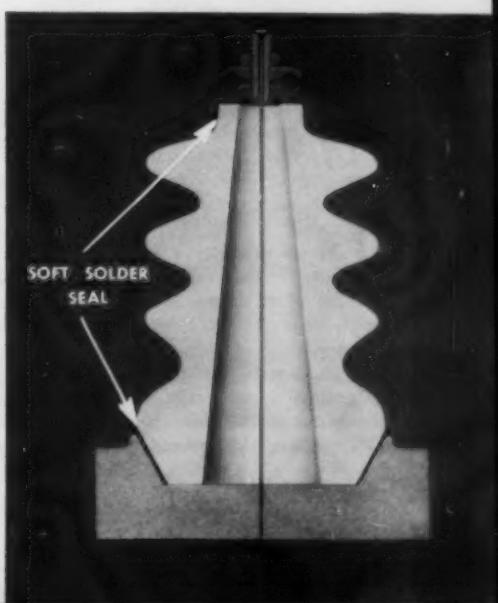
Extra strength bushings are just one of the many *Engineered Extras* in G-E capacitors that make them highest quality, and, your best value. You can always specify G-E capacitors with confidence. *General Electric Co., Schenectady 5, N. Y.*

441-25

G-E CAPACITOR BUSHINGS are welded and soldered to the case for maximum strength.



OTHER CAPACITOR BUSHINGS are attached by only a soft solder seal.



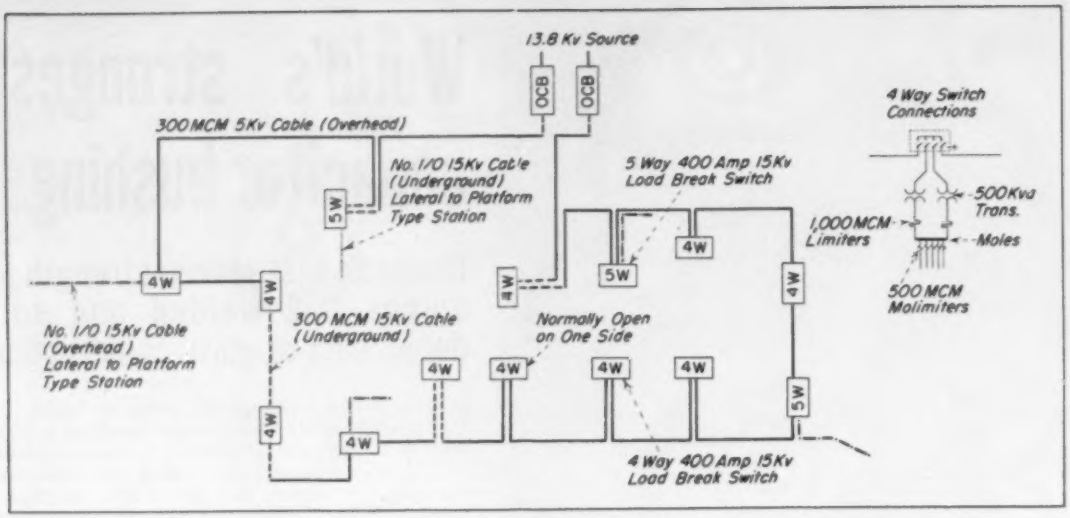


FIG 1—LOOP feeding business district is fed from 13.8-kv line at two points through oil circuit breakers. Completion date is 1956

13.8-Kv Loop Uses Aerial and

HENRY O. KIRKLAND, Senior Engineer, Draftsman, Arkansas Power & Light Co, Pine Bluff, Ark.

Arkansas Power & Light Co recently installed 15,400 conductor ft of cable at Pine Bluff, Ark., in cutting over its overloaded 2.4-kv delta system to one of 13.8-kv wye. Clearance is being provided between the higher-voltage circuits and buildings in the business district by construction of a 15-kv cable loop, instead of a conventional open-wire system, approximately a third of the proposed loop now being completed.

The utility's plans call for aerial cable as part of the loop. To date 13,400 ft of such cable have been installed by the spinning method. The remaining 2,000 ft of installed cable are underground. Transformers are being installed both on overhead steel structures across alleys and in underground vaults.

More construction has been scheduled for 1955, the project having a 1956 completion date.

Cable Loop . . . The loop will be fed from each end through substation oil circuit breakers, and there will be a normally open point half way around the loop. Transformers and short cable laterals are tapped off the loop through manually operated, 400-amp, 15-kv load-break oil switches having single-conductor cableheads. Cableheads of switches in vaults are at the top of the tank. Switches on the overhead portion have cableheads at the bottom of the tanks. Provision has been made to ground each length of cable between switches by means of an extra position on one way of each switch.

Transformers are not protected on the primary side. According to present plans, no open-wire circuits will be connected to the cable. Tangent poles are creosoted pine, 45 ft, Class 3. Dead-end poles are 45 ft, Class 1. Plans call for steel poles on the remainder of the loop.

Aerial cable messengers are anchored with deadmen in concrete with two $\frac{7}{16}$-in. high-strength guy strands per anchor. The number of deadmen varies with the number of cables deadended on the pole.

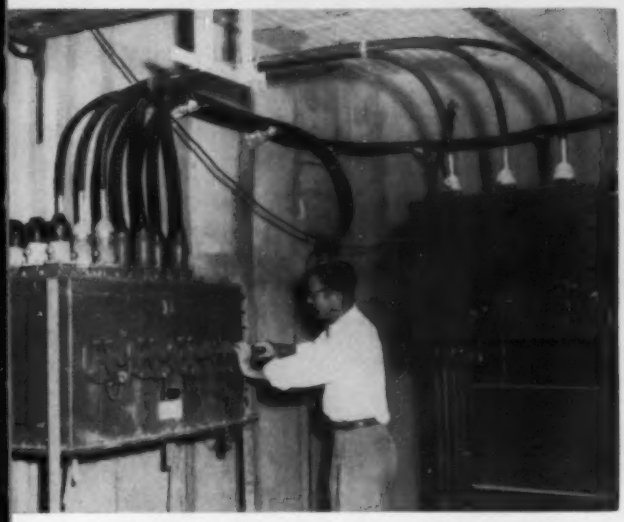
Cables are single-conductor, 300-MCM copper, 15-kv, shielded cable. They were ordered in three 1,000-ft lengths paralleled on each 78-in. diameter reel. They were phase identified by having: 1. no ridges; 2. one ridge; and 3. two ridges. The messenger is 4/0 equivalent Copperweld-copper with ultimate strength of 20,730 lb.

Spinning wire used was 0.091-in. OD annealed Copperweld. Spinner tension was adjusted so that the spinning wire was ordered in bulk and wound onto the spinning machine spools at the company's storeroom.

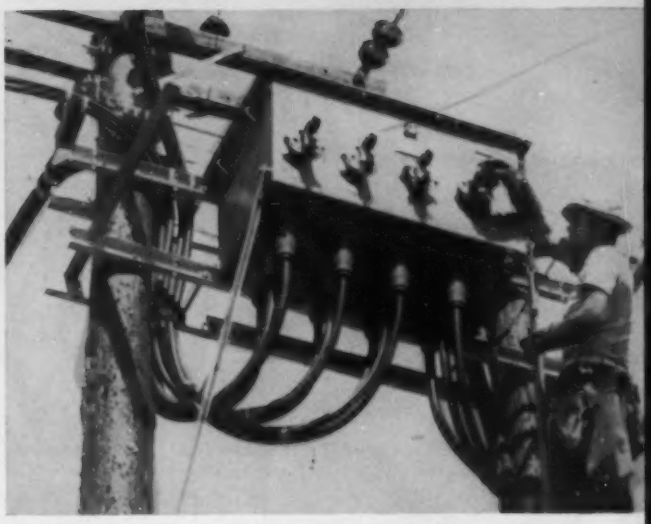
Aerial Cable Installation . . . During installation, the messenger was pulled in, and the clamps at tangent poles were left loose temporarily. The messenger was prestressed to 8,000 lb and allowed to remain 30 min. Then it was sagged and deadends made up.

For stringing, a frame with two seasoned hickory rollers 8 in. wide made 6 in. OD was mounted on the pole at the real end of the pull. These rollers were mounted in the frame on a 36-in. radius. The frame was fabricated by the line crew out of scrap angle iron and stock bolts, and the rollers were turned out by a local woodwork shop.

One roller per 5 ft of span length was placed on the messenger at the pulling side of each pole. These rollers were made by using scrap 28-in. flat crossarm braces, spools from secondary racks, and bolts from stock. An eye was welded to the flat brace for attachment of a 5-ft spacing line with a harness snap. No chipping was found as these spools rolled along the messenger.



FOUR-WAY, 15-KV SWITCH in underground transformer vault. Some transformers are being installed on steel platforms across alleys



OIL SWITCHES mounted on overhead portion of the loop have cables entering at the bottom. The extra cable position is for future use

Underground Cable

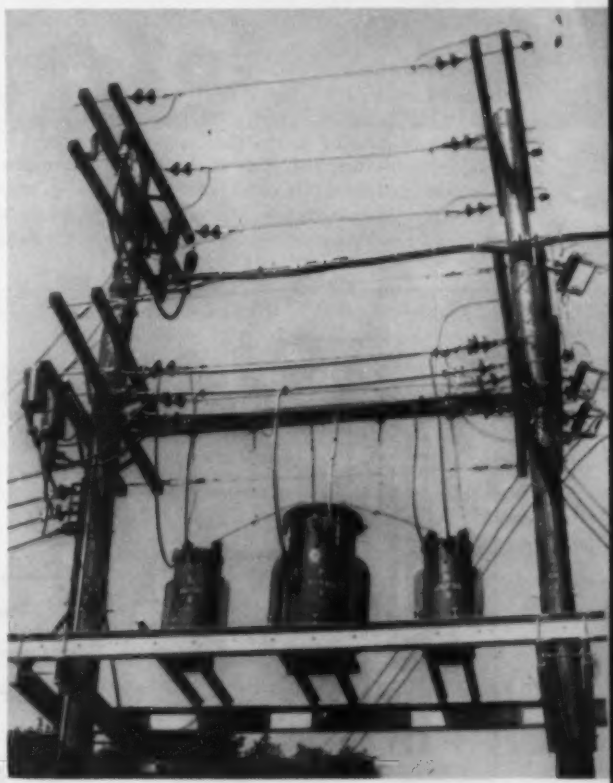
The cable was pulled through the frame at the pole on the reel end of the pull and onto the messenger, and the first messenger roller was attached to the pulling basket by a short length of sash cord. As the cable was pulled, the rollers were released one at a time. When the whole length of cable was supported by rollers, the spinning machine was pulled along, pushing the rollers ahead of it to the next pole. The frame built of scrap material afforded good results in pulling around corners.

The shielding tape was grounded at each splice and each switch, and the messenger was grounded at each pole.

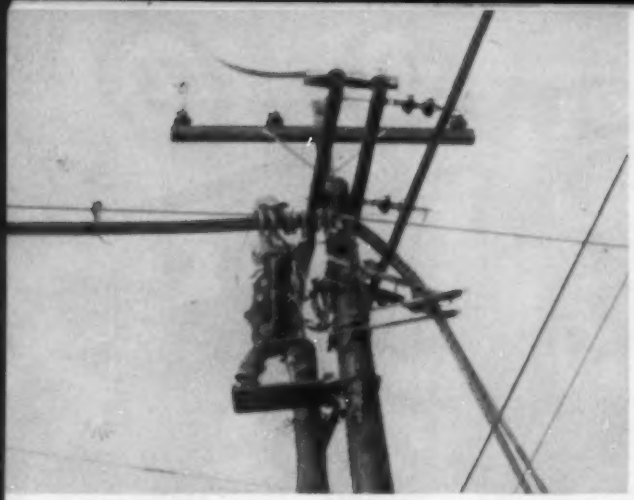
Secondaries . . . The secondary is fed radially from the transformers. Fusing is for the protection of the cable insulation only. Where more than one set of 500-MCM cables were run overhead on messengers, they were paralleled at take-off points by moles at which 4/0 cable was tapped through fuses to a 4/0 copper ring bus.

While small services were run directly from the ring bus, services of 4/0 or 500 MCM were brought out directly from the moles through the fuse. Heavy cotton twine, impregnated with paraffin, lashed the cable to the racks where the secondary was paralleled.

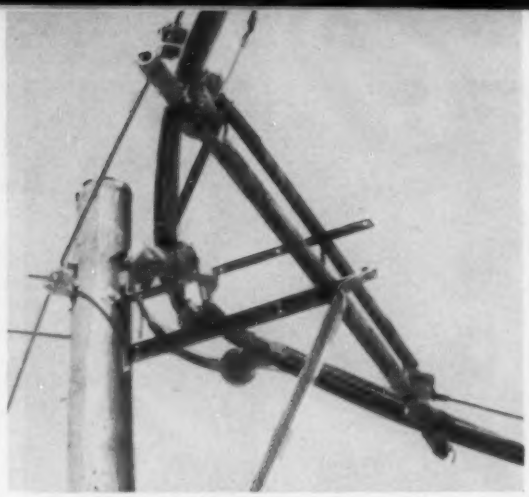
Riser Structures . . . Where cable changed from the aerial position to underground ducts, a conduit riser structure of special design was built. These structures have four or six 5-in. risers, depending on location. Cables are supported in the risers by split type basket-weave grips resting on the end of the conduits. It was found that a good radius bend of cables could be obtained without bending the tops of the risers away from the poles, and without exceeding the recommended minimum bending radius.



CONVENTIONAL TRANSFORMER BANKS were served on short aerial laterals from loop where 500-kva transformer vaults are not justified



AERIAL CABLE was pulled through a frame at the reel end. Messenger rollers, attached with sash cord, were released one at a time



ROLLER FRAME, made of scrap materials in the company's shop, proved a great timesaver for pulling aerial cable around corners

Vaults . . . Vaults were designed for two 500-kva, 3-phase, submersible type network transformers with primary bushings having wiping sleeves emerging from the top of the tanks. Four-way 15-kv switches were mounted on the side walls, their bushings at the same height as the transformer bushings. The switches have wiping sleeves on six terminals for the lead cable going to the transformer and six stuffing boxes for accommodation of rubber insulated cables. Single-conductor, 4/0, paper-lead, 15-kv cable was installed between switch and transformer and supported by angle iron brackets with standard cable rack insulators.

Lateral from Loop . . . To serve a conventional transformer bank on a short aerial lateral from the loop, where a 500-kva transformer and vault were not justified, an oil switch was installed in the loop, and a No. 1/0, 15-kv shielded cable was run from the switch to the standard platform stations. This cable was terminated in single-conductor, 23-kv potheads on the platform structure, the terminals being protected by expulsion-type, 9-kv arresters.

As switches with cableheads at the bottom must be taken out of service and drained of oil before a unit can be removed, Arkansas P&L set up a procedure for making an extra position available for future use. This procedure was followed at two locations. Single-conductor cable in 10-ft lengths was placed in the extra position before making it hot, and the free ends were taped to seal out moisture. The switch position was padlocked open. Later, a lateral will be spliced to these short lengths without taking the switch out of service.

500-Kva Transformer Structures . . . Flash flooding is frequent in alleys, railroad cuts, and shallow building foundations. The utility has designed a steel structure for one 500-kva, 3-phase transformer. These structures, which will span the alleys, will be installed this year. They will be located so that another structure can be built adjacent to two legs common to each structure. Provision will be made for mounting on two levels all accessories normally found in a vault.

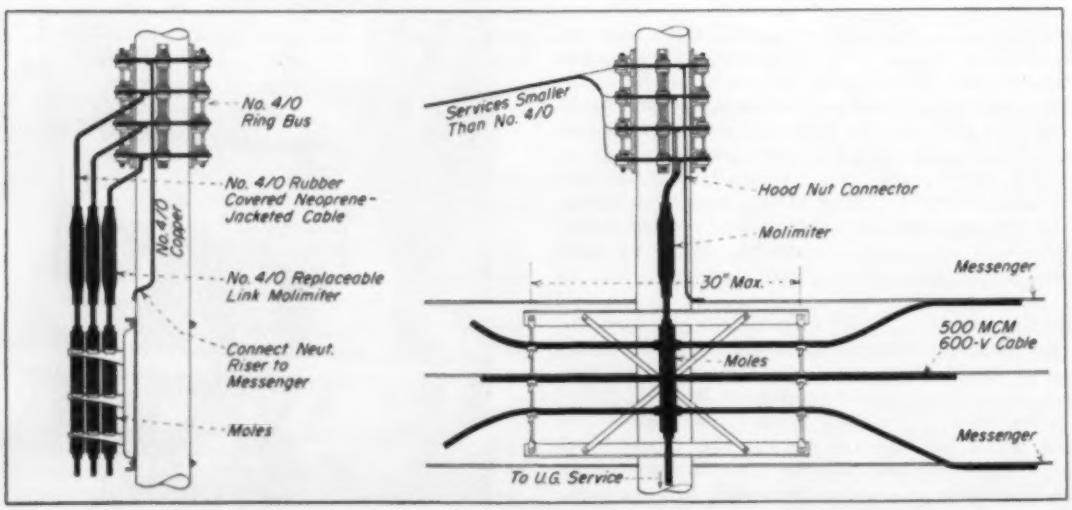
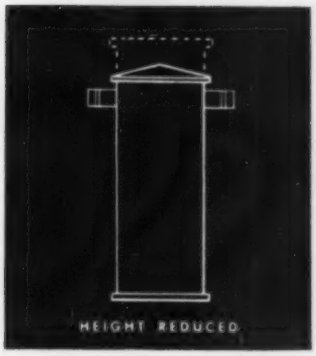


FIG 2—RING BUS AND MOLES are used for paralleling secondary cables at service take-off points. This arrangement is being installed on the system wherever there are more than one set of 500-MCM cables. At moles cable is tapped off through fuses to the copper ring bus

J. W. Durkin, Distribution Transformer Specialist, explains this

FACT: Reduced height simplifies change-outs . . . saves money . . . meets EEI-NEMA standards



The new Westinghouse pole-type distribution transformers in the wall-mounted bushing design, 25 to 50 kva, are the shortest in the industry—*and still meet EEI-NEMA standards.* This height reduction—made possible by compact core-coil assembly design and most practical location of hanger lugs—represents real savings to utilities: existing "joint use" poles can be used when changing to higher ratings.

It's additional proof that your transformer dollar is worth more with Westinghouse.

• • •

Get all the facts from The Man With The Facts—your Westinghouse Sales Engineer. Or write to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. J-70738

YOU CAN BE **SURE**...IF IT'S

Westinghouse

Helping the industry meet its growing loads

Leading the shift to new ASA standards with proved bushing design

The electrical industry has pushed toward constantly increasing standardization of equipment for reasons based on many sound operating economies. The recent ASA bushing standards are fresh evidence of this trend.

Westinghouse has recognized its responsibility to the industry in meeting these standards—with products of proved reliability—with the least amount of delay.

As a result, Westinghouse circuit breakers and transformers are the first available to the industry equipped with a bushing that fully meets the new standards. This bushing, the new Type S, retains the basic solder-sealed condenser construction backed by over 750,000 bushing years of service. It incorporates only minor dimensional changes over the previous design.

This quick response to industry needs is another record achievement of which we are proud and one which we believe reflects the long-term soundness of Westinghouse design aimed at meeting America's growing electrical load —economically—efficiently. J-97185

YOU CAN BE SURE...IF IT'S
Westinghouse

Industry interchangeability reduces spare parts inventory

Type S condenser bushings, now available, are designed to meet ASA mechanical standards for 23 kv through 69 kv, 400- and 1200-ampere ratings.

Basic design features unchanged

Condenser construction, pioneered by Westinghouse and backed up by over 50 years of experience, uniformly distributes voltage to prevent a concentration of stress at any one point. Complete hermetic seal, formed by soldering porcelain to flange and cap, eliminates all gaskets to assure a permanent seal against external contamination.

Now available

Westinghouse manufactures condenser bushings, from stud to porcelain, under closely controlled conditions using the most modern techniques. For best service, be sure to insist on them when purchasing breakers or transformers.

For more information, call your nearby Westinghouse representative or write direct to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

Maxson Elected Senior VP

Raymond D. Maxson, engineering and operating vice president of Commonwealth Edison Co, has been promoted to senior vice-president. In addition, several other executive changes have been made.

J. Harris Ward, vice president, will relinquish his duties in commercial matters and will assist in the administration of duties of the executive vice president.

Murray Joslin, who has been financial vice president, will become vice president in charge of engineering and operating activities. Gordon R. Cory, vice president and comptroller, will, in addition, assume the duties of financial vice president.

Thomas G. Ayers, who has been industrial relations vice president, will be vice president in charge of commercial matters. Carl E. Parker, assistant vice president, will be manager of industrial relations.

Maxson went to work with Public Service Co of Northern Illinois in 1921. He became a vice president of that company in 1943 and in Jan, 1952 he was made vice president of Commonwealth.

R. D. MAXSON

S&C Electric Announces New Sales Managers

E. B. BUSTER

S&C Electric Co has announced the establishment of two new marketing departments. One will be known as the metalclad equipment sales department and the other as the fuse and interrupter sales department.

E. B. Buster will manage metalclad equipment sales and Jack B. Castle, fuse and interrupter sales.

Buster had previously been director of plant engineering for S&C. He joined the company in 1954. Before that, he was owner of the Pacific Rivet & Machine Co.

Castle has been promoted from his previous position as factory sales manager, a position he has held for the last year. He came to the company in 1953 as an application engineer after being associated with the electrical section of the Aluminum Co of America.

J. B. CASTLE

Mitchell Becomes President

Don G. Mitchell, chairman of the board of the Sylvania Electric Products, Inc, has again taken over the presidency of the company to fill the vacancy caused by the recent death of H. Ward Zimmer. He will serve in the dual capacity for an indefinite period, the announcement stated.

Mitchell joined the company as vice president in charge of sales in 1942. After nearly four years in that capacity, he was elected executive vice president in Jan, 1946, and president in May of the same year. He was elected chairman in 1953.

He has been a director of the National Association of Manufacturers, National Electrical Manufacturers Association, and National Sales Executives, and at present is a trustee of the Committee for Economic Development. He is a member of the Board of Trustees, National Industrial Conference Board, and the Board of Trustees, American Enterprise Association.

DON G. MITCHELL

to produce an aluminum pig

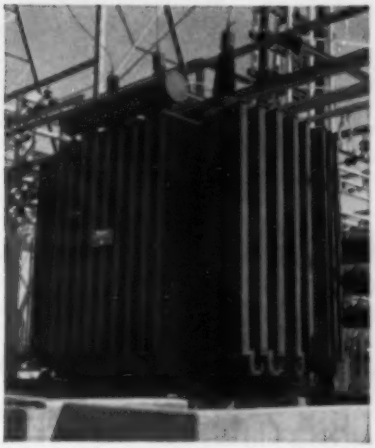
Aluminum, most abundant of all metallic elements on earth, would be one of our rarest metals were it not for the magic of electricity. The production of aluminum is a highly complex electrolytic process.

A major step in this process—the transformation of bauxite into 50 pound aluminum pigs—takes place in huge smelting plants, like the Rockdale, Texas plant of the Aluminum Company of America.

At Rockdale, Wagner transformers play an essential role in this process. This bank of four Wagner Power Transformers was recently installed in the main substation at this plant. Each is rated 25,000/33,333/41,667 kva, 138,000 to 13,800 volts.

Such banks of Wagner Power Transformers can be found at many great industrial plants . . . because they handle their never-ending job of supplying proper voltages for every purpose with great efficiency and dependability.

Let a skilled Wagner engineer discuss your transformer needs with you. Call the nearest of our 32 branch offices, or write us direct.



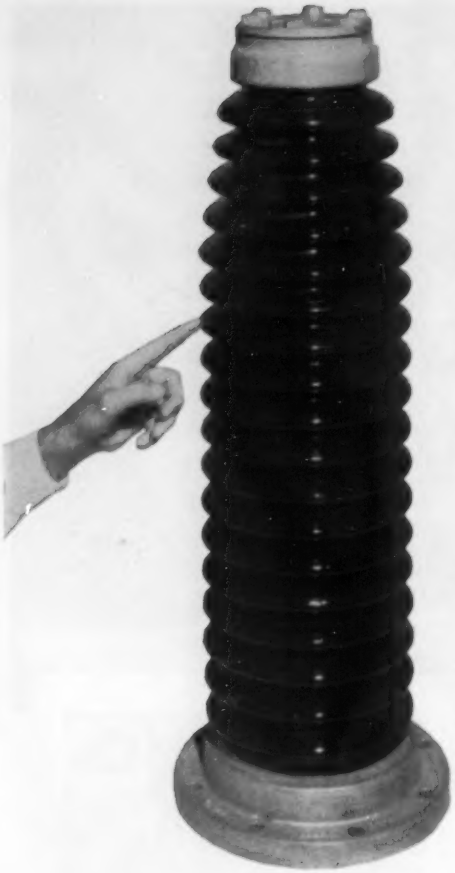
Here is one of the four Wagner Power Transformers that form the main substation shown above. Each is rated 25,000/33,333/41,667 kva.

WAGNER ELECTRIC CORPORATION
6456 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

WT55-1



THIS IS A PRECIPITATOR POST

This insulating support is 35″ high, 9½″ diameter, weighs 140 pounds, and is tapered for trim appearance and reduced clearance at the top. It is a single integral porcelain—like all Lapp porcelains, made in one piece rather than of sections glazed together. It is one of hundreds of Lapp designs incorporating Lapp Fog-Type corrugations—for handling the serious contamination problems characteristic in precipitator applications.

Among insulators in use today, probably none encounter more severe mechanical and electrical duty than do those for electrical precipitator insulation. Surface contamination ranges from thick layers of dust to hot tar on the insulators. Operation may be at temperatures ranging up to several hundred degrees F. They encounter high humidity, thermal shock, mechanical impact and high bending loads.

In many years of experience in production of insulators for precipitators, Lapp has never made an effort to be "low bidder" for this business. Yet a steadily increasing percentage of all such insulators are made by Lapp. Where requirements are most severe, the value of Lapp design and Lapp production methods is quickly evident. Where the only measure of performance is in a long service record—it takes longer. But . . . on any porcelain component on your system . . . on every insulator supporting your transmission lines . . . the name LAPP is a symbol of an *extra* margin of operating security, long life, low upkeep.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

Oklahoma G&E Promotes Anthony, Harlan

C. W. ANTHONY

Two members of the Oklahoma Gas & Electric Co have moved into higher positions in the company, Donald S. Kennedy, president, has announced.

Clarence W. Anthony, who for the past three years has been assistant superintendent of transmission and distribution, became assistant to the vice president in charge of operations. In this new position he will assist Walter B. Gesell, vice president, in matters associated with transmission, distribution, generation, construction, and engineering.

Ross E. Harlan, who formerly served as a rate analyst, has been named the company's supervisor of rates and contracts. He will also work with Vice President Gesell.

R. E. HARLAN

PERSONAL BRIEFS

Hobart C. Ramsey, Worthington Corp chairman, has been elected a board member of the National Industrial Conference Board for a term of one year . . . **Paul V. Hayden,** vice president of Connecticut Light & Power Co, has been re-elected president of the Connecticut Development Credit Corp . . . **Newton D. Smith,** formerly with General Electric Co and Charles T. Main Co, has joined the engineering staff of the Franklin County PUD at Pasco, Wash.

Seelye Stevenson Value & Knecht, consulting engineers, New York, has admitted the following to its partnership: **Gilbert D. Fish, A. Roger Kelly, Erik B. J. Roos, Stephen D. Teetor,** and **Harold S. Woodward** . . . **Joseph C. Langaunet** has been appointed a product sales manager in charge of bus duct, trolley duct, and related equipment of Federal Pacific Electric Co . . . **Clifford H. Keen** has been appointed assistant general sales manager of Hubbard & Co . . . **Richard L. Erlin** has been named manager of engineering sales for Kaiser Steel Corp . . . **Thomas Hollingsworth** has been appointed assistant to the manager of the agency and construction sales department, apparatus division of the Westinghouse Electric Corp.

William Rogers Coe, vice president, treasurer and director of Virginian Railway Co, has been made a director of Long Island Lighting Co . . . **M. M. Hardin,** Albuquerque, N. M., has been elected a director of the Kennecott Copper Co . . . **Ralph C. Krueger** has been appointed an assistant manager of the industrial sales of the Du Pont Co's film department, a new position created as a result of increasing volume of business in the industrial field.

Joe C. Taylor, head of Alabama Power Co's traffic department, and with the company since 1916, retired on March 1 . . . **H. C. Cummins,** first vice president of Northern States Power Co, retired on Feb. 28 after 45 years in the utility industry. Most of that time was spent with NSP and its predecessor companies.

Dwight B. Moore has been appointed safety director of the Duke Power Co . . . **Glenn M. Geyer,** New Ulm, Minn., has been employed as a consultant on construction of Denton, Tex., new steam plant. Geyer will become superintendent of electrical operations of Denton County Electric Cooperative after the plant is placed in operation, which is scheduled for June 15. **W. T. Elliott,** power plant superintendent, will continue in his present capacity until June 1, after which he will take over the duties of water production superintendent.

Harold T. Barrows has been named superintendent of the Middletown steam plant of the Hartford Electric Light Co, succeeding **Fred L. Gibson** who retired after nearly 48 years with the company . . . **John H. Countryman,** Northern Division manager of the New Jersey Power & Light Co, has retired after 32 years with the company . . . **Ernest Elliott,** district superintendent of the Consumers Public Power District, Columbus, Neb., has been advanced to district manager at Plattsmouth . . . **Harry Day** has been appointed as district superintendent for the Corvallis section of the Pacific Power & Light Co.

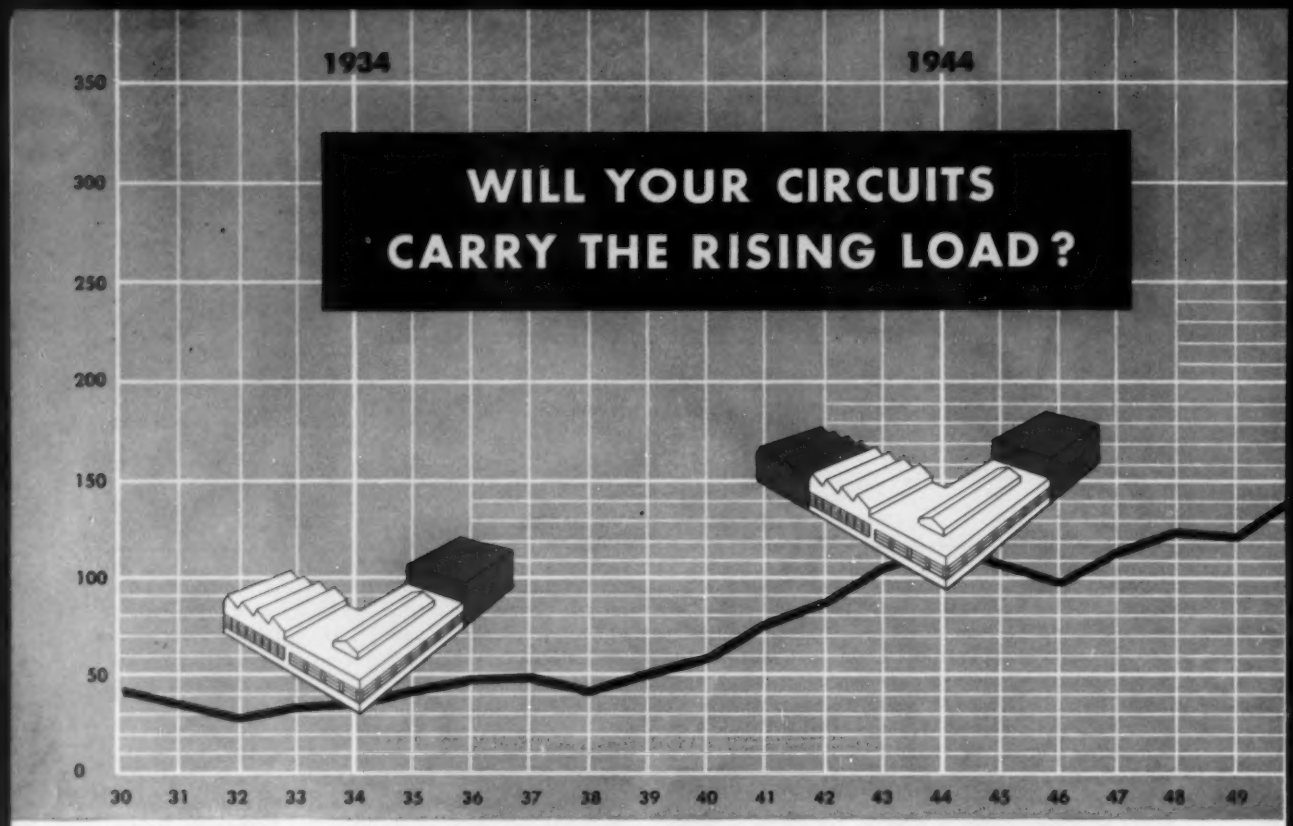
OBITUARY

Bonnell W. Clark, 71, retired vice president in charge of sales of the Westinghouse Electric Corp, died in Stamford, Conn., on March 3. He had been with Westinghouse for 24 years. He was a former president of the National Electrical Manufacturers Association and the National Association of Electrical Distributors.

William Russell Burrows, 82, a retired vice president of the General Electric Co, died in Newark, N. J., on March 2. He had been associated with GE for more than 50 years in its Schenectady and New York offices before retiring in 1945 as vice president in charge of manufacturing.

Carl E. Gieseker, 60, treasurer of the Washington Water Power Co, died recently of a heart attack. He became treasurer of the company in 1942. **Emil V. Olson,** 63, safety supervisor for WWP since 1945, died recently.

John C. Loy, president of Porcelain Products, Inc, Findlay, Ohio, died recently.



Here's how to protect a wiring investment with G-E feeder systems

New electrical equipment, processes, and materials handling methods double the industrial use of electricity approximately every ten years. Because the unstable voltages that result from overloads tend to increase distribution and equipment maintenance costs, and result in outages, faulty operation of equipment and interrupted production—your plant, new or old, may quickly reach the point where a new or expanded distribution system will prove economical.

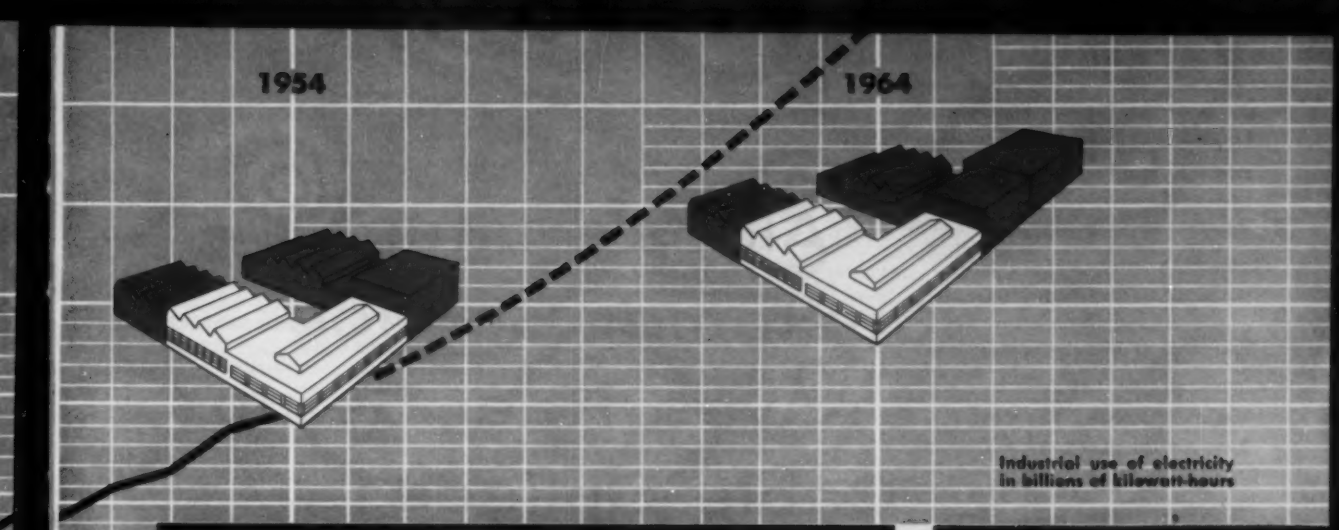
The versatility and expansibility of a G-E V-c interlocked armor cable feeder system, because it is designed to meet today's and tomorrow's needs, protects your investment. These systems can be installed quickly. Cables can be easily added or relocated to accommodate changes in load pattern. (See illustrations for typical solutions to problems for old and new construction.)

Installation costs on armor cable are lower, too. The highly flexible, interlocked cable goes in fast—indoors or outdoors, around corners, over beams, and in long runs. Cable can be installed on low cost racks, baskets, troughs, or messengers, and can be spliced with simple mechanical joints. As a result, both engineering time and installation time are cut substantially.

For more information on handling increased loads this economical way, write Section W153-327, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.

Progress Is Our Most Important Product

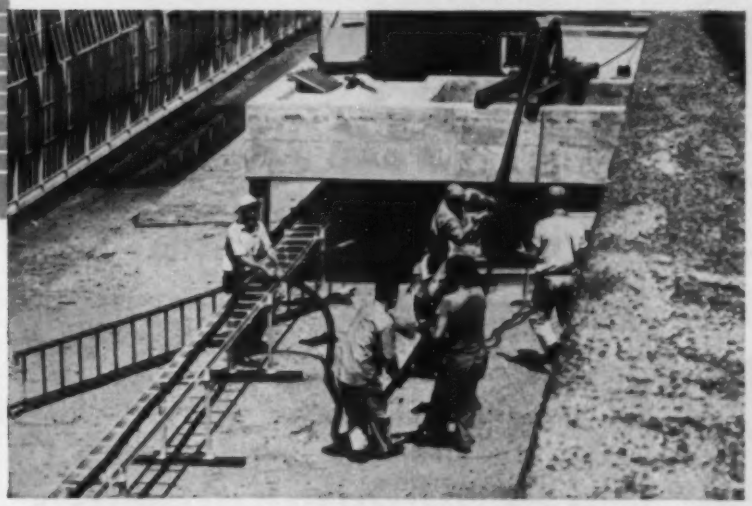
GENERAL ELECTRIC

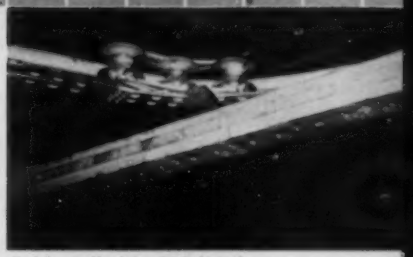


Industrial use of electricity in billions of kilowatt-hours

A VERSATILE SYSTEM

No winches were needed—crew pulled all cable by hand from reel on ground.



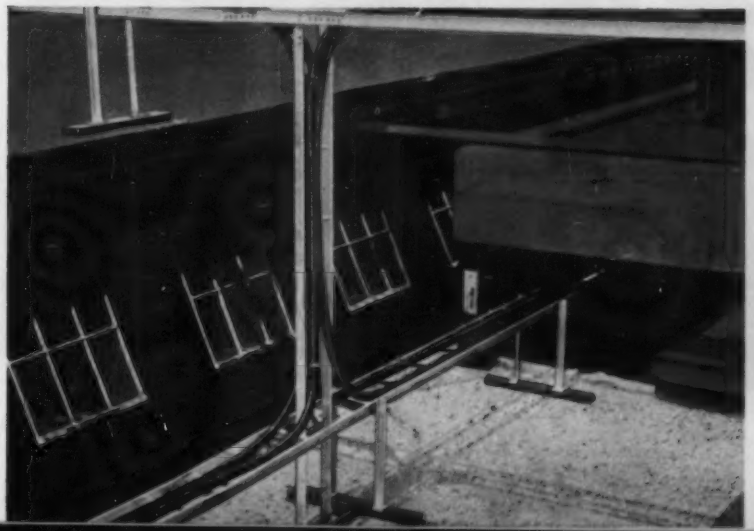


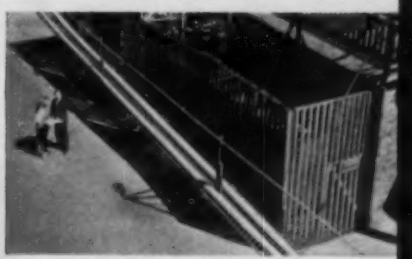
Cable pulled in 90° bend using triple pulley.

Compact mechanical splice needs no special skill.

TYPICAL INSTALLATIONS

Racks carry cables from one roof level to another. Note 90° bend.





Building to building on messenger. A clean compact job.

VCI bends easily. Corners and projections are no problem.

Alcoa's latest Customer Service saves Reel Setups, Cable Splices

Here's a reel advantage—pioneered by Alcoa—that means far fewer reel setups, fewer splices to be made by your line crews.

Alcoa is now shipping, at its customer's request, transmission conductor on the largest reels ever used for aluminum cable in the United States. Eight feet in diameter, five feet wide, they make it possible to ship a 7,400-foot length of 1.75" diameter Expanded ACSR on each reel.

These giant reels are the latest example of service, again proving Alcoa to be best from the first, first with the best. Consult Alcoa for help with your conductor problems.

ALUMINUM COMPANY OF AMERICA,
2107-C Alcoa Building,
Pittsburgh 19, Pa.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA

MEETINGS CALENDAR

An extended list of coming meetings appears in the last issue of each month.

MARCH

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION—Winter Meeting, Edgewater Beach Hotel, Chicago, March 13-18.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS—Utilization of Aluminum Conference, William Penn Hotel, Pittsburgh, March 15-17.

EDISON ELECTRIC INSTITUTE—Industrial Relations Committee, EEI Headquarters, New York, March 17; 21st Annual Sales Conference, Edgewater Beach Hotel, Chicago, March 28-31.

PUBLIC INFORMATION PROGRAM—Mid-Atlantic Region, Jefferson Hotel, Richmond, Va., March 18.

SOUTHEASTERN ELECTRIC EXCHANGE—Annual Meeting, Boca-Raton Hotel and Club, Boca Raton, Fla., March 21-23.

INSTITUTE OF RADIO ENGINEERS—National Convention, Waldorf-Astoria Hotel, March 21-24, New York.

ROCKY MOUNTAIN ELECTRICAL LEAGUE—Electric Meter Institute, University of Denver, Denver, Colo., March 21-25.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Management Conference, Hotel Statler, Cleveland, Ohio, March 23-24.

MISSOURI VALLEY ELECTRIC ASSOCIATION—Engineering Conference, President Hotel, Kansas City, Mo., March 23-25.

OKLAHOMA UTILITIES ASSOCIATION—Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25.

CONTROLLERS INSTITUTE OF AMERICA—Southern Conference, Mayo Hotel, Tulsa, Okla., March 25-26.

AMERICAN POWER CONFERENCE—17th Annual Meeting, Sherman Hotel, Chicago, March 30-April 1.

ILLUMINATING ENGINEERING SOCIETY—Southwestern Regional Conference, Ft. Harrison Hotel, Clearwater, Fla., March 31-April 1.

APRIL

ILLUMINATING ENGINEERING SOCIETY—Southwestern Regional Conference, Gunter Hotel, San Antonio, Tex., April 3-5; Inter Mountain Regional Conference, Westward Ho Hotel, Phoenix, Ariz., April 11-13; South Pacific Coast Regional Conference, Statler Hotel, Los Angeles, April 14-15; Pacific Northwest Regional Conference, Harrison Hot Springs Hotel, Harrison Lake, B. C., April 25-26.

*__AMERICAN INSTITUTE OF ELECTRIC ENGINEERS__—Subcommittee on Rubber and Plastics Industries of the Committee on General Industry Applications, Mayflower Hotel, Akron, Ohio, April 4-5; Southern District Meeting, Sarena Hotel, St. Petersburg, Fla., April 13-15.

ATOMIC INDUSTRIAL FORUM, INC—Meeting on "Atomic Energy—The New Industrial Frontier," jointly sponsored by Stanford Research Institute, Mark Hopkins Hotel, San Francisco, April 4-5.

15TH ANNUAL YOUNG MEN'S UTILITY CONFERENCE—Ipalco Hall, Indianapolis Power & Light Co, Indianapolis, Ind., April 6-7.

PACIFIC COAST ELECTRICAL ASSOCIATION—Joint Conference with Pacific Coast Gas Association, Administrative Services and Accounting Section, Jokane Inn, Phoenix, Ariz., April 7-8.

SOUTHEASTERN ELECTRIC EXCHANGE—Engineering and Operation Section, Roosevelt Hotel, New Orleans, La., April 7-8.

NORTHWEST ELECTRIC LIGHT & POWER ASSOCIATION—Engineering and Operation Section with Personnel and Safety Section, Davenport Hotel, Spokane, April 13-15.

ROCKY MOUNTAIN ELECTRICAL LEAGUE—Annual Spring Conference, Shirley-Savoy Hotel, Denver, Colo., April 17-19.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS—Spring Meeting, Lord Baltimore and Southern Hotels, Baltimore, Md., April 18-21.

NORTHWEST PUBLIC POWER ASSOCIATION—Annual Meeting, Eugene Hotel, Eugene, Ore., April 20-22.

AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS—8th Annual Conference for Protective Relay Engineers, Sponsored by Department of Electrical Engineering, College Station, Tex., April 25-27.

EDISON ELECTRIC INSTITUTE—Industrial Relations Committee, EEI Headquarters, New York, April 21; Meter and Service Committee, Washington-Duke Hotel, Durham, N. C., April 25-27.

*__PENNSYLVANIA ELECTRIC ASSOCIATION__—Spring Meeting, Meter Committee, Washington-Duke Hotel, Durham, N. C., April 28-29.

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*Additions this week

Copper Supply Expected to Remain Tight, U. S. Says

The U. S. copper situation is likely to remain tight for the next three to six months, according to spokesmen in the Foreign Operations Administration and State Department. They look for an easing of the shortage in Europe somewhat before that happens here, because of the higher prices for copper in West Europe, which will entice African and Chilean exporters to sell there before they sell here.

However, one or two voices in Commerce and Interior Departments look for the shortage to be eased within two months. They predict little government action to ease the situation—hoping it will follow its course without further U. S. exporter license suspensions, diversions from the emergency stockpile, or other government aids to private business.

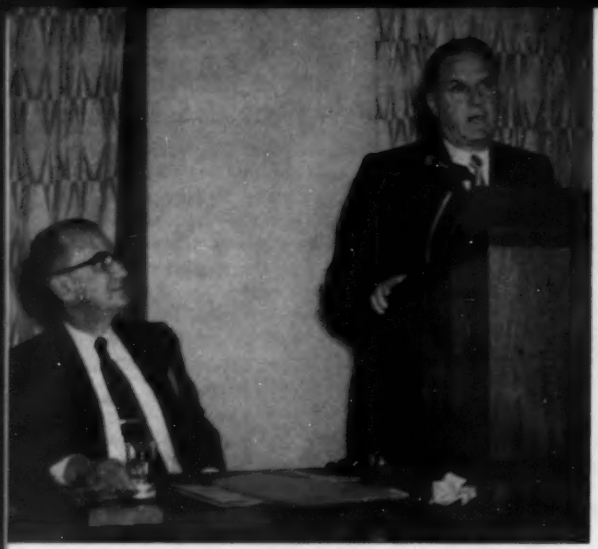
An additional 8,000 short tons of copper were released to private industry Feb. 25 by the Office of Defense Mobilization. This chunk came from the Defense Production Administration's inventory—selling what it had on hand to private industry, as well as any other deliveries coming in to DPA warehouses through the end of March, 1955.

The government's limitation of copper scrap exports to 6,000 short tons of copper scrap and 6,000 tons of copper in copper-base alloy scrap through the end of March will undoubtedly be extended through the second quarter of 1955.

The Commerce Department has amended orders to reduce percentages of mill space devoted to fill deliveries of copper and copper-base alloys for military and atomic orders in the second quarter by 14%, down 18 million pounds to 108 million pounds.

Get Commonwealth Work

Commonwealth Edison Co has announced that Sargent & Lundy will design the installation of a 205,000-kw unit to replace generating capacity rated at 60,000-kw which went into operation at Crawford Station in 1925. Contract for designing the addition of a 250,000-kw unit at the Will County Station has been awarded to Stone & Webster. Crawford addition is scheduled for completion in 1958 and the Will County unit in late 1957.



CHAIRMAN D. B. Clayton, Keynoter J. W. Evers

Conferees at National Adequate Wiring Conference Agree That . . .

AW Has Potential Billion-$$ Market

Wiring modernization has a market potential of billions of dollars. Everyone of the 400 persons present at the eleventh annual National Adequate Wiring Conference, Feb. 24-25, at Chicago, agreed on this. But they disagreed on how many billion. Figures ranged from $3 billion to $9 billion. It was also agreed that tapping the wiring market would open the way to more billions in appliance sales.

Better coordination of local programs was proposed by A. F. Metz, Okonite Co. He referred to the "wire on time" movement and said despite its rapid growth it cannot be advertised nationally. He thought that if national advertising could say, "You can modernize your wiring for as little as $5 a month," we would go a long way toward eliminating inadequate wiring in older homes.

F. B. McKown, Kennecott Sales Corp, proposed that the industry concentrate its advertising and promotion program in a single month, to be known as National Adequate Wiring Month. To show what might be accomplished McKown cited what the industry did during Light's Diamond Jubilee.

Evers Describes Commonwealth's Program . . . Wiring today is like the old single lane highway, it must be rebuilt for the modern traffic of electrical living, declared J. W. Evers, president, Commonwealth Edison Co. In his keynote address he described his company's program of wiring modernization. The company installs 3-wire service to the meter if the customer buys a new range, water heater, automatic washer, dryer, or air conditioner and installs a 100-amp service entrance switch and a 240-v circuit to the appliance.

The 1955 Adequate Wiring program will blanket the entire industry, said L. E. Barrett, chairman of the Plan Committee of the National Adequate Wiring Bureau. The program is covered by seven kits which Barrett described as "our seven keys opening doors to sales opportunities for everyone in the electrical field." The kits were developed for: the wiring modernization market, the new home market, electrical contractors, electrical dealers, the educational field, and the formation of new local adequate wiring bureaus. One kit tells the part of utilities, electrical contractors, distributors, dealers, and manufacturer representatives in the program.

Specialty selling, screening of requests, and plugging the safety theme were among the reasons given for the success of time-payment plans. Radio brings more inquiries per dollar than any other medium. But you have to use radio, TV, newspapers, billboards, and all types of promotion to do a good job, the panel agreed.

Suggestions for improvements in the wire-on-time programs included:

1. Concentrate on off season for contractors.
2. Increase the time for payments.
3. Do more promotion and add more follow through.
4. Put wiring and appliances on the same contract.
5. Promote through the home service department.
6. Make greater use of Consolidated Edison's film, "The Magic Link."
7. Run campaigns with the contractors from time to time.
8. Improve salesmanship and follow through more quickly.

Wire-On-Time Programs Succeed . . . Since Cincinnati launched its wire-on-time program, 25 others have been launched. They have proved very successful. Cincinnati reported 1,110 jobs on its program, totaling $70,000.

Ninety percent of farms are inadequately wired for their present loads, R. T. Jones, Pennsylvania Power & Light Co, told the conference. Farm wiring potential, he said, is like a barrel full of opportunities, but it is leaking away through the many holes in the farm wiring activity.

C. P. Wagner, North Central Electrical League, described its one-day "Wire Rama" when a farm was completely rewired in one day. Newspapers, radio, TV, and farmers for miles around attended. It was so successful another is being planned for 1955.

Pays off at the take-off!

this KEARNEY COMBINATION will speed your construction

Here's a complete "system" for making trouble-free mid-span take-offs in less time. Everything needed is made by Kearney . . . to Kearney quality standards . . . field-tested to help your crews do a better job every time.

SPAN CLAMP provides a practical and dependable way of dead-ending service wires to the bare neutral of the secondary in mid span. It is used in combination with the . . .

WEDGE-TITE CLAMP . . . easy to use and dependable because it is self-tightening. Constructed of corrosion-resistant materials throughout and plated for use on all types of conductors.

SQUEEZON CONNECTORS embody the newest developments in easy-to-install, reliable compression connectors. May be used for bi-metallic connections.

SERVICE CABLE TIES are made of soft aluminum. May be easily applied with finger pressure to secure insulated wires to the bare neutral.

AIRSEAL completely seals connections against air, moisture and any other corrosive elements. Easily kneaded on by hand . . . never hardens or cracks.

277

For Better Construction---Safer Maintenance

JAMES R. KEARNEY

Specify **KEARNEY PRODUCTS**

The Mark of Quality

JAMES R. KEARNEY CORPORATION • 4234-42 CLAYTON AVENUE, ST. LOUIS 10, MISSOURI • Canadian Plant: GUELPH, ONTARIO

To Provide E-H-V Circuits Tomorrow . . .

Cable Makers Need Encouragement

Manufacturers' research must discover if 220-230-kv low-pressure oil-filled cable is least expensive. Dielectric losses in 300-kv range must be overcome

L. I. KOMIVES, Asst General Superintendent, Underground Lines Department, Detroit Edison Co, Detroit, Mich.

American manufacturers should be encouraged by cable users to begin development today on cable for long circuits at 300 kv. Such a circuit will probably be needed ten or twelve years hence, and the interim could be profitably used in development and field testing. Such a program will need a minimum of six, possibly ten, years and is essential if there is to be assurance that the cables will be capable of carrying the expected loads.

Load concentrations, the size of power blocks to be taken from power plants now being built or planned in congested areas, and the difficulties of getting rights-of-way through these areas augur extra-high-voltage cables for such installations.

Foreign Makers Active in E-H-V Field

France is now conducting tests on 225-kv and Great Britain on 275-kv cables. Several European cable manufacturers who have 400-kv cables operating under particularly favorable conditions are actively testing such cables for general use. Several 400-kv cables in operation in Sweden were manufactured by Swedish and French firms. The cables appear to be such that they could be recommended for installation for short station entrance cables in areaways, or tunnels, with little further testing.

It now appears that this type of installation may be needed here shortly when a new station will be built for future extra-high-voltage transmission.

Detroit Edison Co has been interested in this problem, and the company's engineers have been studying European developments for several years. The author, as a member of a three-man team, recently toured Europe to further those studies. European transmission engineers have put their ideas into practice ahead of American engineers in this field. The earlier development was required because large blocks of power are transmitted much farther than in this country.

A short high-pressure oil-filled cable line has been in service at 400 kv for more than two years in the northern part of Sweden. The cable, rated at 400 kva, 600 amp, is installed in an ideal location with respect to ambient temperatures and heat dissipation. It has been carrying about 70% of its rating quite regularly.

Recently three installations were made in Sweden using cables with twice that current-carrying capacity. These cables are expected to carry 1,200 amp continuously at 425 kv, equivalent to over 800 Mva under controlled temperature conditions, 25C maximum.

A 380-kv high-pressure oil-filled cable is under test at the testing laboratories of Electricite de France at Fontenay. This cable is in the open, not buried in the ground.

A 225-kv, buried, pipe-type compression cable has been under a 380-kv test for longer than a year at a manufacturer's plant in France. At 380 kv this cable is rated around 400 Mva, but the manufacturer maintains that a 400-kv cable, which will carry 800 Mva or more, maximum size in pipe, would be practicable for installation and use.

Canadian and British manufacturers have built and installed low-pressure oil-filled cables for 300-kv service in Northwestern Canada. Three British manufacturers have submitted test lengths to be tested at Staythorpe, Midlands, by connecting them in series with one phase of an existing 275-kv overhead line. Three such samples—one low-pressure oil filled, one self-contained impregnated pressure, and one self-contained compression—have been under test since March of last year. While comparatively light loads have been carried thus far, loads resulting in 80C copper temperatures are expected in the near future.

Many 220-230-kv cables are in service in European countries, all the low-pressure oil-filled type. The best known of these installations is the long Paris line which, serving as a system tie, has been in use since late 1935 and has a very good service record.

Switzerland, Italy, Western Germany, Norway, and Sweden also have such cable lines in service. While this type of cable has been generally accepted for this service in Europe, comprehensive long-time tests are being made by Electricite de France on six other types of 225-kv cables to reduce costs of such installations.

American Range is 100-150-Kv

The highest voltage cables in service in the United States are in the 100-150-kv range. There are approximately as many miles and installations of high-pressure pipe-type cables as there are low-pressure oil-filled cables. The same is true for Great Britain except that in place of pipe-type cable installations, of which there are only two or three, there are many self-contained high-pressure cable installations.

In Germany the number of miles and installations of pipe-type compression cables in this voltage classification about equals the length and number of low-pressure oil-filled cable installations.

It is usually assumed that the performance of all these cables is satisfactory and that selection may be made on the basic of lowest cost. In view of the above observations, these conclusions may be drawn:

1. In the 100-150-kv range no technical problems exist.

2. In the 220-230-kv range, the low-pressure, oil-filled cable has been proven, but other types may be less expensive.

3. The 275-300-kv range approaches the critical voltage limits for present-day installations because of dielectric losses. Testing is in progress, and one line is in service.

"Hold it, Bill!

We never scrap

POLE STAR

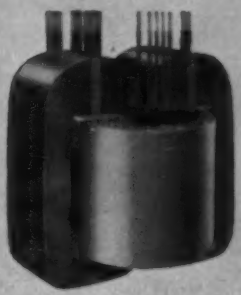
core and coil units...

It's more economical to repair or replace a damaged coil."

How right the man is! It's a relatively simple matter to remove the Pole Star core from the coils and then reassemble the entire unit. No special tools are needed. What is more, the core can be rebuilt with replacement coils without appreciably affecting the low core loss or low exciting current of the Pole Star.

Since there are no gaps or butt joints in the core, no mechanical clamping device is required to hold the core together. This outstanding construction feature of Pennsylvania Pole Star transformers allows the coil to be quickly and cheaply replaced if it is damaged by lightning or by being too heavily overloaded.

Core laminations are inserted into the coils, brought through, and individually lapped. No special tools are needed, and the annealed steel is not bent beyond its elastic limits.



Core and coils of Pole Star transformers form an integral unit and are self-supporting.

Pennsylvania Pole Star transformers are manufactured in sizes 3 Kva through 500 Kva and 480 volts through 67,000 volts.

Pennsylvania Transformer Company

A McGraw Electric Company Division

CANONSBURG • PENNSYLVANIA

1 **REINFORCING CAGE of 12¾-in. rods is first positioned on flat section of form. Then sides of form are assembled**

2 **INSERTING STEEL MANDREL into the cage is the next step to provide the pole with a tapered hollow section**

Florida Power Makes Concrete

Cast 35-ft poles used on distribution and street lighting systems give good results. Longer poles for 110-kv transmission lines are now being developed

H. K. McKEAN, Vice President, Florida Power Corp, St. Petersburg, Fla.

Concrete poles are being developed by Florida Power Corp to reduce distribution line costs. A by-product has been attractive appearance. Experience with the "homemade" 35-ft poles has been so satisfactory for both distribution and street lighting that longer poles are being designed and transmission poles considered.

Decision to design and construct concrete poles on an experimental basis was reached after two years' research and preliminary cost studies. No recently published data were available in this country on concrete structures for power lines. But literature was obtained from France, Italy, Germany, and Mexico. Fortunately, the company had several employees who were capable translators.

Poles Reinforced with Steel Rods . . . Design was made of a 35-ft tapered concrete pole having an octagonal section 29 ft long with a 6-ft long round section on top. Diameter at the bottom between flat surfaces of the octagonal section is one ft, and outside diameter at the top is 6 in. The pole is hollow with an inside diameter of 7½ in. at the bottom and 1½ in. at the top.

Reinforcement for the pole is provided by a cage consisting of 12¾-in. rods. Four of the rods are 35 ft long, four 30 ft long, and four 25 ft. long. Preformed spacers of No. 10 steel wire are used to hold the cage in shape.

To cast a pole, the reinforcing cage is positioned on the flat section of a three-section steel form, and the remaining sections are assembled around the cage. A steel mandrel is run through the cage to form the hollow center. Galvanized sheet metal tubes are placed in the forms to provide bolt holes for mounting insulators, crossarms, etc.

Then a 1:2:3 mix of concrete is poured through the top of the form. Forms are stripped about four hours after pouring. Then the top and bottom openings to the pole's hollow section are closed and the interior filled with water. Poles are cured for 30 days and then used.

Finished-pole weight is about 2,100 lb and breaking strength 2,000 lb, with the load applied 1 ft from the top. Therefore, the safe working load is 1,000 lb.

Setting methods for concrete poles are the same as for other poles. An average of three poles per hour have been set by a normal-sized crew. Creepers for climbing poles, developed in Germany, have been obtained for experiments. However, at present, safety considerations require the poles to be worked from ladder trucks.

The distribution line constructed with concrete poles presents a very pleasing appearance. All poles are uniform in size, taper, and color. Because the line is located on a causeway across Tampa Bay, it will be subjected to severe service conditions, such as hurricane winds, salt spray, and wave action. Under these conditions, accelerated life expectancy data can be obtained.

Street Lighting Application Also Successful . . . Experimental installations have also been made using the poles for street lighting. In this application pole costs are reduced as much as 60% with accompanynig high strength and nice appearance.

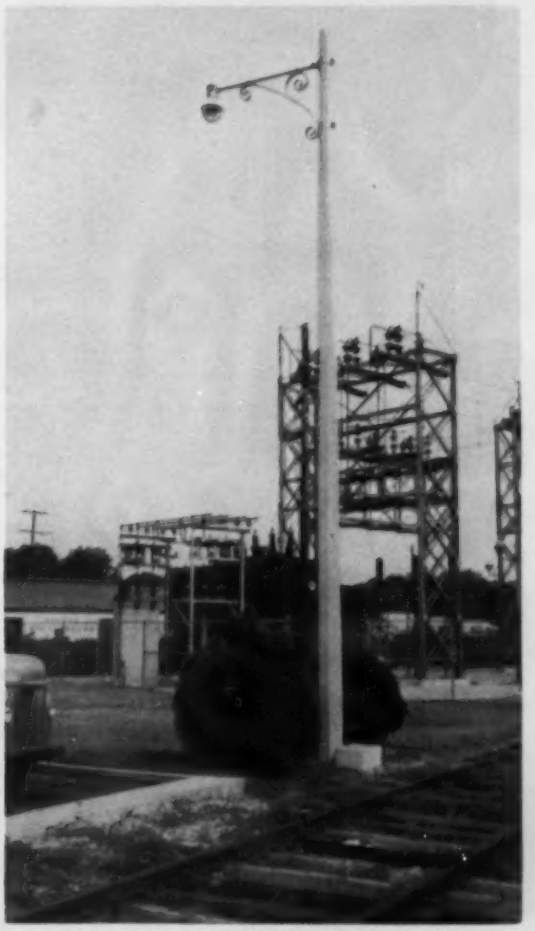
Results of the company's experiments with 35-ft concrete poles have been so satisfactory that 45-ft poles of the same design are being developed. This pole is probably the maximum length that can be fabricated satisfactory and economically by casting methods.

However, concrete-pole transmission-line construction appears so attractive that designs have been prepared for prestressed poles of 65 and 70 ft lengths. This year the company expects to build a section of 110-kv line using concrete poles and concrete arms.

3 **CONCRETE IS POURED** and allowed to set about four hours. Then mandrel and sides are removed

4 **HOLLOW SECTION** of pole is closed at both ends and filled with water. After curing 30 days poles can be used

Poles to Reduce Distribution Costs



CONCRETE POLES FOR DISTRIBUTION AND STREET LIGHTING are set with the same methods used for other poles. Ladder trucks are used to work on set poles because safety considerations rule out use of foreign-made creepers by linemen

AND EVERY HYLUG SIZE BETWEEN

WITH TOOLS AND DIES FOR ANY SIZE

BURNDY

54-18

NORWALK, CONNECT. — TORONTO, CANADA • *Factories:* NEW YORK, CALIF., TORONTO • *Export:* PHILIPS EXPORT COMPANY

UWUA Ends Consumers Power Strike

Less than 24 hours after Utility Workers of America-CIO struck Consumers Power Co, Jackson, Mich., the tie-up was called off by the union leaders (EW, March 7, p72). Supervisory personnel maintained normal service during this period.

The UWUA had called the walkout at midnight, Monday, Feb. 28, ignoring a state law calling for a 30-day waiting period while a fact-finding panel studied the dispute and made recommendations.

The Michigan Labor Mediation Board had certified the contract dispute to Gov G. Mennen Williams who named a fact-finding panel. He appointed Russell A. Smith, secretary of the University of Michigan Law School, chairman, and Robert G. Howlett, Grand Rapids, and Paul T. Sorensen, Muskegon, as members of the panel. These latter two are attorneys.

The panel, after they were named, said they would hold an organizational meeting but would not meet with both parties until the workers went back to their jobs.

In the meantime, the strike was called off after a series of phone calls between Chairman George Bowles of the Michigan Labor Mediation Board and Joseph Fisher, UWUA's international president. Fisher agreed to meet with the panel.

The union met with the members of the panel on Thursday, March 3. However, Fisher said the group would not recognize the legality of the panel.

Fisher had insisted that any agreement be made retroactive to midnight Feb. 28 and that the company reimburse the union for any time spent by the union representative before the panel.

The union is reported to have asked for a 15¢ an hour wage increase. The union is also seeking 43 contract changes, and about 12 changes in the pension plan. Negotiations over the past few weeks had tentatively settled about 20 of the points in question.

Consumers, which reportedly offered a 7¢ an hour increase, said the union demands would cost 55¢ an hour.

The next meeting of the panel is scheduled for April 14 at 9 a.m.

This is the fourth straight year negotiations have been deadlocked until the previous contract expired. However, only once before, in 1952, did the union call a strike. That strike lasted 18 hours.

Reds Training More Engineers

One of the reasons why the U. S. is losing its scientific manpower advantage to the Soviet Union is a shortage of technically-trained American women, Dr John T. Rettaliata, president of Illinois Institute of Technology, said recently.

He declared that education of women in engineering has been progressing at a "snail's pace" when compared with Russia, where an estimated 25% of the engineers are women.

In this country, less than 1% of the approximately 500,000 engineers are females, the Illinois Tech president pointed out. The number of Russian engineers of both sexes is estimated at about 100,000 fewer than the American total. But, he added, in the last four years the Soviet Union has graduated about 154,000 engineers but the U. S. only 116,000.

Last year's engineering graduates from American colleges and universities were put at only about 20,000 as compared with 54,000 for the Russian institutions of higher education.

Commenting on women's opportunities in technical occupations, Dr Rettaliata said: "The scope and variety of work offered in engineering is almost limitless. There is an engineering position suited to almost every temperament, talent, and taste. He declared that women pioneers in the profession have 'broken the ice' in industry, and many corporations, particularly the larger ones, are employing women engineers in a variety of capacities in which they are trained.

"But the number engaged in engineering activities is far from enough," he warned. "Many, many more will be needed to replenish the ranks of the profession to the point of safety."

He said that most young women probably are not aware that about 75% of all engineers are in administration, management, design, research, and development, and that the minority remainder are employed in manufacturing, production, construction, or other operating functions.

Wisconsin EP and IBEW Agree to 2% Pay Boost

Wisconsin Electric Power Co and the International Brotherhood of Electrical Workers-AFL have agreed to a 2% wage increase.

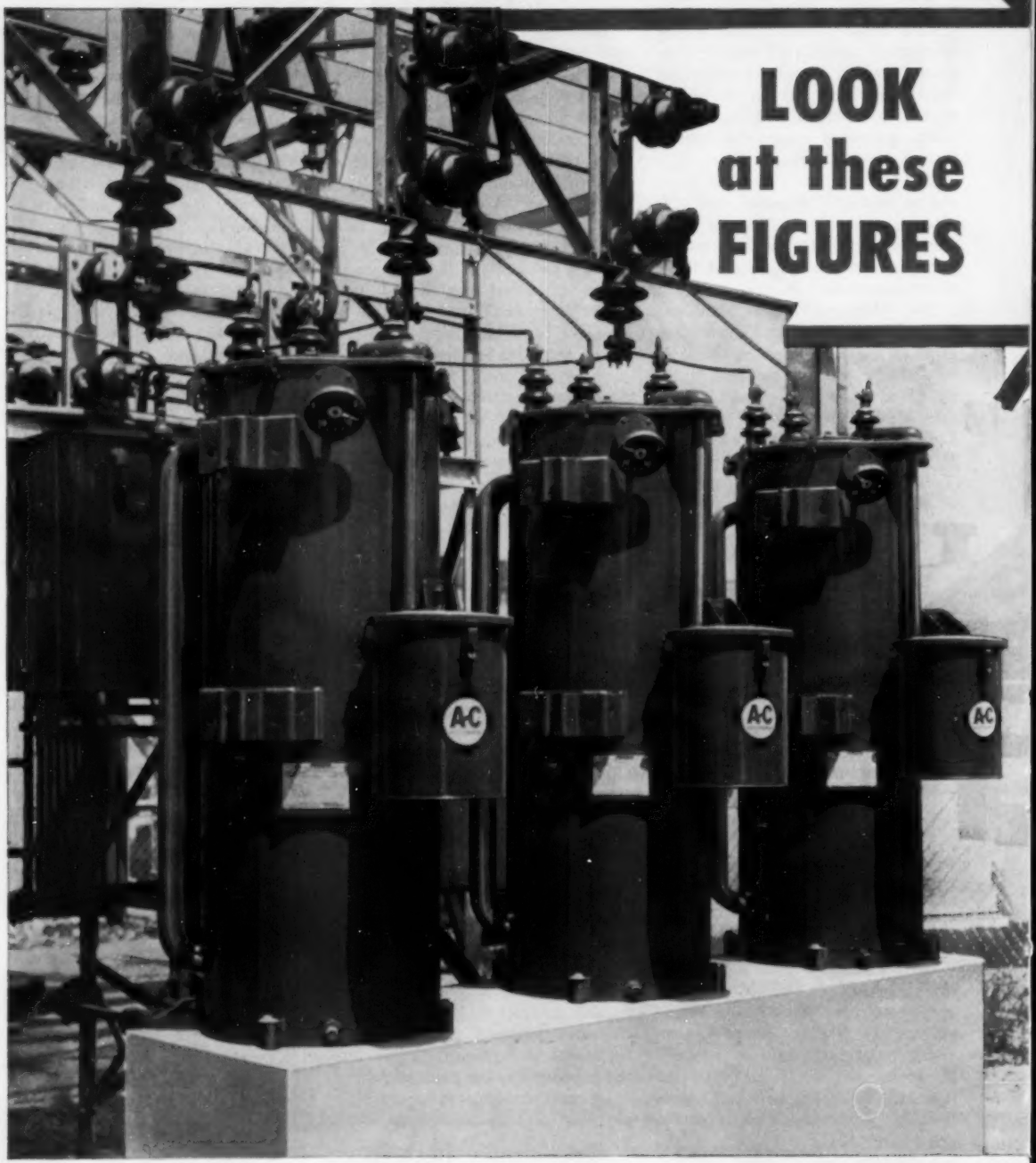
The new contract is similar in improvements to the agreement recently signed by a local of the United Association of Office, Sales, and Technical Employees and the company. It provides for a 2% wage hike retroactive to Dec. 16, 1954, a fourth week of vacation after 25 years' service, a half holiday Christmas eve, payment of 10% of total yearly wages as a year-end bonus for the 15th consecutive year, and improved sick leave and military pay policies.

Honolulu IBEW Buys Property for Building

The International Brotherhood of Electrical Workers-AFL, Local 1260, has purchased property of 16,723 sq ft for $50,000 in Honolulu, T. H., as the site for a headquarters building.

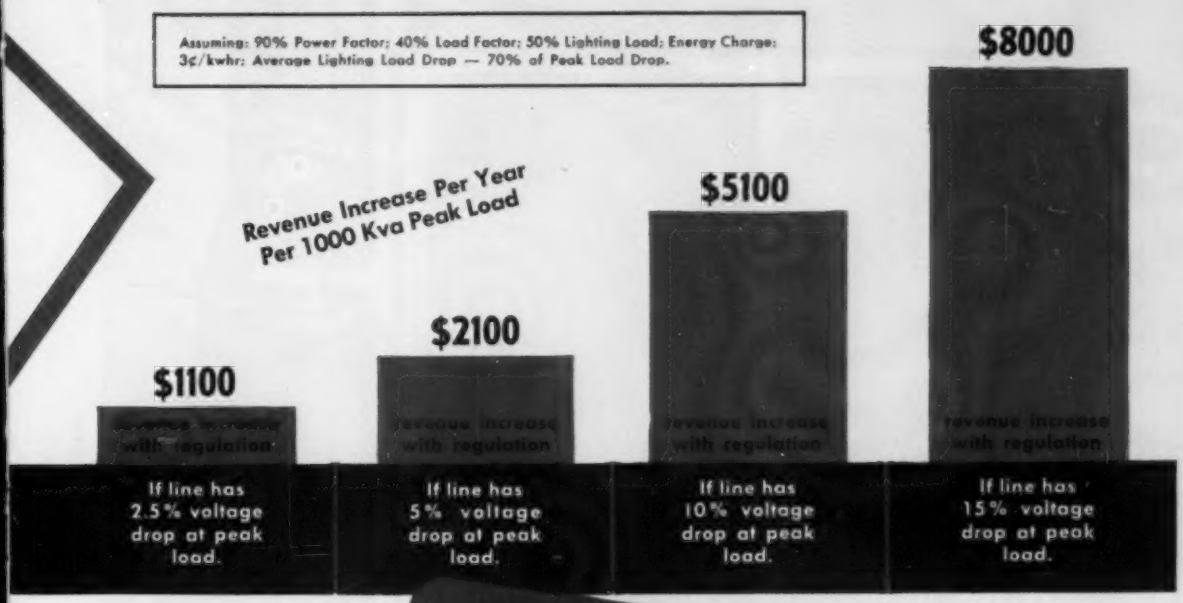
The local, largest of four electrical workers' locals in Hawaii, has a membership of 1,600. There are no immediate building plans. Two old homes now on the land will be rented, and a third will be used as a temporary union headquarters.

How Voltage



ALLIS-

Regulation Pays Off


Assuming: 90% Power Factor; 40% Load Factor; 50% Lighting Load; Energy Charge: 3¢/kwhr; Average Lighting Load Drop — 70% of Peak Load Drop.
Revenue Increase Per Year Per 1000 Kva Peak Load
$1100
$2100
$5100
$8000
revenue increase with regulation
If line has 2.5% voltage drop at peak load.
If line has 5% voltage drop at peak load.
If line has 10% voltage drop at peak load.
If line has 15% voltage drop at peak load.

ALLIS-CHALMERS
5/8% STEP VOLTAGE REGULATORS

• Here's what happens when you install an Allis-Chalmers distribution regulator on a line where voltage is only 5% low: in the first year revenue per regulator goes up $2100. That's more than the regulator costs. And taking all cost factors into consideration — that's enough to pay back the initial investment in less than two years, in most cases. From then on (long before the end of your normal depreciation period), the distribution regulator helps you make additional profits.

Best of all, at the same time you improve revenue you also improve customer satisfaction. With correct voltage, motors last longer, lights burn brighter, appliances give most efficient service. You get an added dividend: fewer complaints due to low voltage. You can concentrate service crews and equipment where they are really needed instead of wasting manpower and money testing voltage at customers' homes.

Keep Maintenance Low, Get Long Life

When you specify Allis-Chalmers voltage regulators you know you're getting a unit with minimum maintenance, longest possible life. No other ⅝% step regulator offers proof from years of actual field experience. Allis-Chalmers step-type regulators have been turning in excellent service records for more than 20 years.

For example, the mechanism is tested and proved to withstand 5 million operations. It will provide practically trouble-free operation. Ask any of the hundreds of distribution engineers who have had experience with it. They'll tell you why it pays to use only Allis-Chalmers voltage regulators.

More facts are available. Get them from your nearby A-C district office or write Allis-Chalmers, Milwaukee 1, Wis. A-4562

CHALMERS A-C

There's no room inside for "frozen" thinking. For steam power progress will be measured in the future, as it has been in the past, by a lack of inhibition characteristic of Americans when they face engineering and financial problems.

No matter what you do, no matter what you make, the heat, light, and power you need must in large part come from coal, oil, gas and other fuels. And steam will be the medium for transforming the energy in those fuels into useable power. That's why it is important to you that B&W engineers tackle each new job with the determination that it can and must be an improvement over the excellent jobs that preceded it. Their thinking about how to give you cheaper power is not hampered by "sacred-cows" or slavish obedience to past practice.

Today, plants all over America are operating more efficiently because of B&W steam-generating improvements like Cyclone Steam Separators, coal pulverizers, advances in oil and gas firing, Cyclone Furnaces, pressure firing, high-temperature alloy steels, shop-assembled steam generators, use of increasingly higher pressures and temperatures, and waste-heat boilers and similar heat recovery equipment.

The door is open for tomorrow's contributions to the remarkable science of steam generation. You can rest assured that B&W engineers will continue to pioneer in the search for better ways to convert the raw energy which lies dormant in coal, oil, gas and other fuels into high-level, useable energy for the common good.

BABCOCK & WILCOX
BOILER DIVISION

H-T83

How Hard to Sell?

Washington Water Power promotes again after post-war layoff; appliance sales zoom

Biggest year for appliance sales in history was rolled up in 1954 in the Spokane, Wash. and Inland Empire area—the first post war year that Washington Water Power Co has actively promoted sales. An estimated 181,652 appliances were sold, valued at more than $17.9 million. This is some $3 million higher than for the previous record year, 1953.

Figures announced by Inland Empire Electrical League, show that sales of automatic washers and driers, promoted extensively during 1954 in WWP campaigns, jumped 31.6% and 57.3% respectively. Television set sales, however, showed a drop.

Joseph J. Thomas, League president, forecast a sales increase of 15% for 1955 in a talk at the League's annual banquet. Kinsey M. Robinson, WWP president, called '55 "the year of promise" for utilities, but he warned dealers they must do a better job of selling adequate wiring, "one of the industry's most pressing problems."

League plans "man of year" contests in '55 with $500 and $1,000 prizes for top salesmen and dealers.

Tilting Fixture Directionalizes Light

An adjustable mounting bracket permits this fluorescent street lighting fixture, developed by Westinghouse Electric Corp's Lighting Division, to be set horizontally or tilted to any angle between 20 and 30 deg. Manufacturer says this allows "directing" of the light's greatest intensity toward desired area and reduces wasted back lighting. Upper hood of the fixture is made of a special permanently colored, laminated fiber glass which requires no paint maintenance. Fixture employs four 72-in. fluorescent lamps, is corrosion resistant, and is sealed against insects, dirt and water.

S & S SHORTS

Cool Air for Rent

An air conditioning rental service for apartment houses and multi-unit factory buildings is being offered in the New York metropolitan area by Broadway Maintenance Corp of Long Island City, N. Y. Broadway says plan has double advantage: It eliminates capital outlay and it increases rental revenues and desirability of older properties. Rental units will be placed in any building where 60% or more of the tenants want the service. Cost for installation and maintenance runs between 75c and $1 per sq. ft.

Distributor Margins Drop—NAED

Average gross margin (percentage to sales) of electric appliance, apparatus and supply distributors "is going nowhere but down" says the National Association of Electrical Distributors in releasing its most recent cost survey study. Gross margin rate dropped from 15.3% in April, 1953 to 14.1% last year for apparatus and supply distributors; from a range of 14.5% to 17.1% in 1950 for appliance distributors to 12.3%-15.9% in 1954. Net profits, says NAED, have fared even worse.

Water System Sales Look Good

Sales of more than 1 million electric water systems are anticipated this year by National Association of Domestic and Farm Pump Manufacturers. Sales last year approached 750,000 mark. As to size of the market, R. B. McLeaish, administrator of U. S. Department of Agriculture's Farmer's Home Administration, says that more than 2 million American farms are still without running water.

USDA Plugs Infrared for Farrowing

Use of infrared lamps during and after farrowing can save hog producers an average of 3 pigs in 2 litters points out a new U. S. Department of Agriculture publication, "Infrared Lamps . . . Their Use in Brooding Pigs", Leaflet 381. A single free copy may be obtained from the Office of Information, Department of Agriculture, Washington 25, D. C.

TEST ROOM of new Underwriters' Laboratories has sufficient work benches and convenience outlets to handle many pieces of electrical equipment simultaneously. A burnout room, fireproofed and ventilated, permits testing equipment to destruction

New Underwriters' Lab for West Coast

The new Underwriters' Laboratories, Inc, testing and office building, Santa Clara, Calif., is evidence of electrical equipment manufacture growth in the West. This building marks the third increase in size since the first western laboratory was started in 1923. Designed primarily for electrical testing, space is available on the 7-acre plot for future construction of a fire testing laboratory if needed. Built of concrete, steel, and fire-resisting plaster, it should be the most fireproof building in the West.

Many electrical features have been incorporated into the building. A 500-kva, 660-v transformer with tap-changing panel provides a wide variety of voltages for testing purposes. Distribution to all parts of the building is provided through trenches, cellular steel floors, a wall-inserted trough and necessary switching. Provision has been made for expansion of electrical troughing should the building be enlarged.

There are special facilities for testing oil and gas-burning automatic controlled equipment. A wet room provides space for testing water-using equipment and for rain tightness. A controlled-temperature room simulates desert heat or arctic cold. Another room tests to the point of burning out. Also included is a picture-taking area and darkroom; all-purpose room; and storage, crating and handling facilities.

Delta-Star Bus Duct Furnished to OVEC

When the eleven 200,000-kw steam electric generators of the Ohio Valley Electric Corp are in operation in the spring of 1956, all connections between the generators and transformers will be equipment furnished by Delta-Star Electric Division of the H. K. Porter Co Inc. Two 200,000-kw generator units, one at Clifty Creek and one at Kyger Creek, went on the lines in late January.

The connections are non-segregated phase bus duct for 15.5-kv operation. Duct sections are designed and detailed to mount on the power plant structural members and are shipped completely assembled.

They have aluminum perforated enclosures on bottom, which are removable for conductor installation and inspection. Conductors are 6,000-amp ventilated square copper tubing. Insulators are heavy-duty outdoor post-type for both indoor and outdoor sections of duct.

Coffing Hoist Purchased by Duff-Norton Mfg. Co.

The Duff-Norton Manufacturing Co of Pittsburgh, Pa., has purchased, effective March 1, the Coffing Hoist Co of Danville, Ill., and will operate the firm as the Coffing Hoist Division of the Duff-Norton Co (name being changed in interest of brevity).

Duff-Norton's line of ratchet, hydraulic, air motor and worm gear jacks will be expanded by Coffing's line of hand and electric operated hoists and allied products.

Operations and personnel will continue unchanged at the Coffing plant except that Frederick W. Coffing, president and co-founder of the 26-year old company, will retire. But he will continue to be associated with the Division as a consultant.

Walter I. Floyd, president of Duff-Norton, will also be president of Coffing Hoist Division. J. R. Coffing, vice president-sales; J. F. Bookwalter, vice president-manufacturing; and George Buck, secretary-treasurer, will continue to direct the affairs of the Coffing Hoist Division as a Management Committee.

Brown Boveri Acquires Stockwell; Ups Service

Brown Boveri Corp of New York has acquired the Stockwell Transformer Corp of Akron, Ohio, according to Paul R. Sidler, Brown Boveri's president. In addition the company will increase its engineering service department in the New York headquarters.

In the merger the name of "Stockwell" will be discontinued. "The manufacture of transformers under 2,500 kva will likewise be discontinued," Sidler stated, "since it is impractical to integrate these small power transformers with the main line of Brown Boveri equipment which primarily covers the heavy-duty, high-capacity field."

Brown Boveri also reports that it plans to erect a combination service center and warehouse unit in the near future. The plant is expected to serve as a servicing organization for Brown Boveri as well as Stockwell equipment.

(*Continued on page* 59)

cables spliced for life WITH OKONITE *rubber splicing Tapes*

1 PERFECT BONDING
Okolite and Okoprene Tapes bond firmly together, eliminating air or moisture-filled danger spots.

2 NO SEPARATE LAYERS
Okolite Tape has fused into a solid mass, perfectly bonded to the cable insulation.

3 NO AIR POCKETS
Impression left by conductor strands shows absence of voids.

Unretouched photo of cutaway splice

All too frequently, cable failures are traced to bad splices. Careful splicing alone is not enough; the use of high-grade splicing materials is essential and economical in the long run. Okonite splicing tapes have proved themselves in the severest test of all—uninterrupted long-time service under all installation conditions.

The cutaway section of a 5kv unshielded cable splice shown here demonstrates perfectly the elements that make up a long-lasting splice. The perfectly bonded, homogeneous wall provided by Okolite and Okoprene Tapes prevents dangerous air pockets that result in a weak insulating joint.

Okolite High Voltage Tape was developed by Okonite engineers for splicing all rubber-insulated cables made with ozone-resisting compounds, particularly for those cables operating over 2000 volts. A single thickness of Okolite Tape has a dielectric strength of more than 17,000 volts. It is ozone and moisture resistant, has a high insulating resistance and excellent aging properties. Okoprene Tape, applied over the Okolite insulating tape, gives the lasting protection of a neoprene sheath to all types of cable splices. Highly resistant to weather, oil, acids and heat, Okoprene Tape gives additional protection through its high dielectric strength of over 7500 volts per single thickness.

Bulletin EW-1089 gives full details on all Okonite splicing tapes, and on the reasons they mean better splices. Write for it today. The Okonite Company, Passaic, N. J.

2954

AVAILABLE THROUGH AUTHORIZED DISTRIBUTORS ONLY

Two Big Bonuses—

Yours—when you purchase Locke Insulators

Two important bonus values are yours every time you order Locke Insulators.

BONUS #1

Ready to serve you is Locke's highly trained field service organization. It is the insulator industry's most competent factory-employed nation-wide technical service group. Call upon us freely . . . for help on any insulation problem . . . routine or emergency.

BONUS #2

"Thanks for your order!" is just the beginning . . . *not the end* . . . of our obligation to you and your company. At your service are the facilities of the world's best-equipped high voltage and research laboratories. Take advantage of them . . . whether your insulation problem is one of preliminary design, construction or operations.

These bonuses are included in the regular price of a Locke Insulator. They add immeasurably to its value. Obviously, you get more for your money when you specify Locke.

LOCKE

LOCKE DEPARTMENT
GENERAL ELECTRIC COMPANY
BALTIMORE, MARYLAND

Brown Boveri Acquires

(*Continued from page 56*)

The addition of personnel to the engineering service department in New York will provide more technical assistance to users and installers of Brown Boveri equipment. This personnel is now being trained in the main Swiss plant of the corporation.

A-C Completes LTC Transformer in 30 Days

What is believed to be the shortest manufacturing cycle ever attained for construction of a load tap changing transformer—30 days—was recently chalked up by Allis-Chalmers Manufacturing Co.

Construction of the 2500-kva unit was started the morning after the order was received from a midwestern utility. Coils were ready in one week.

The 45,000-lb transformer, complete with bushings and radiator attached, was trucked to its site just 30 days after receipt of the order, ready for immediate hook-up by the utility. Normal construction time for a load tap changing transformer is about four months.

Delivery of the transformer was critical because of the following situation. The utility was forced to install its spare portable substation to handle the demand on a station located in a mushrooming residential area. With its only spare portable thus employed, the utility faced a serious system outage through failure of any unit.

Westinghouse Gets Order For 138-Kv C-A Breakers

Eleven 138-kv outdoor compressed-air breakers having an interrupting capacity of 10 million kva are reportedly the first of this rating to be built for an electric utility by an American manufacturer. The breakers have been ordered by Consolidated Edison Co of New York Inc from Westinghouse Electric Corp.

Although the breakers will operate at air pressures of approximately 350 psi, they are said to be practically noiseless in operation. The breakers will be applied in highly congested areas served by the utility.

UNIQUE BIRD PROTECTION. Scores of kingbirds are perched on Otter Tail Power Co lines. They scare away the many crows and hawks that may cause short-circuit problems. Reported doing a good service, the kingbirds are realistically painted, wooden birds fastened to the lines by Line Material-Fargo hot-line clamps.

MANUFACTURING BRIEFS

Baldwin-Lima-Hamilton Corp has acquired 100% ownership of Ruge-de Forest Inc of Cambridge, Mass. Latter's products are electrical-load measuring cells and fluid-pressure measuring devices, electrical strain gauges, and related electronic equipment. Dr. Arthur Ruge, Frank Hines and Edgar J. Jones will continue to direct operations.

Micro Switch, a division of Minneapolis-Honeywell Regulator Co, has opened an assembly plant in Independence, Iowa, for production of mercury switches and snap-acting switch products. Initial production would provide employment for 50 to 100 persons. Some new products are expected to be added during 1955 as tooling becomes available.

Polarad Electronics Corp has acquired 55,000 sq ft in a new plant at 43-20 34th St, Long Island City, N. Y. Here administration and executive offices and engineering will be centralized. The additional facilities will provide for a 50% increase in engineering and production capacity.

Cannon Electric Co of Los Angeles, Calif, has completed plans for a one-story, 30,000-sq ft administration and engineering building across from the main Humboldt St plant. In the latter, facilities will be expanded to increase production of plug type connectors for instruments and electronic applications.

Electrical Show. Third National Electrical Industries Show is scheduled for October 11 to 14 inclusive at 69th Regiment Armory, New York City. The directors have re-adopted the theme "Safety Through Adequate Wiring in American Homes and Business." Sponsored by the Eastern Electrical Wholesalers Association, the Show headquarters are located at 19 West 44th St, New York City.

Porcelain Reflector Co held groundbreaking ceremonies recently for a 22,000 sq ft area addition to its Erwin, Pa., plant. In part of the space the company will install modern washing, degreasing and painting equipment for processing metal parts for lighting equipment.

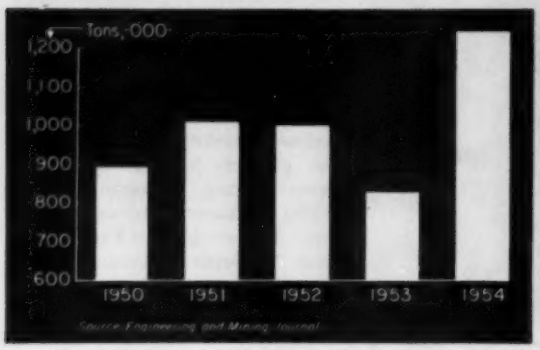
Mack Trucks, Inc, has acquired White Industries, Inc, and Radio Sonic Corp, New York manufacturers in the field of electronics for industrial, aviation and military applications. The truck manufacturer has formed an Electronic Division for product diversification.

Association for Computing Machinery will hold the 1955 annual general meeting at the Moore School of Electrical Engineering, University of Pennsylvania, September 14-16 inclusive. Further details may be obtained from Sidney Kaplan, Computing Systems Engineering, Radio Corp of America, Building 13-2, Camden 2, N. J.

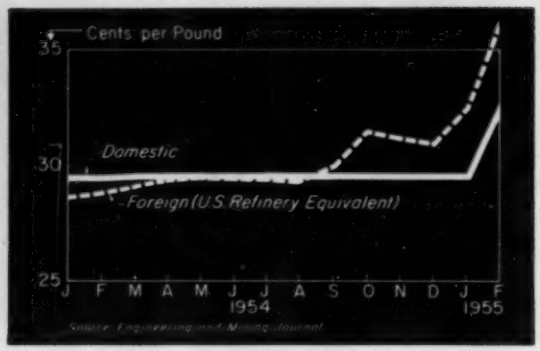
Line Material Co, according to W. D. Kyle, Jr, president, expects 1955 business to be 6.5% increase in shipments over 1954. Last year was the biggest on record by gaining 9.3% over 1953. The company has 10 plants and 68 warehouses in the U. S., Alaska and Canada.

International Business Machines Corp plans to begin construction of two buildings, about 96,000 sq ft of floor area, adjacent to its Research Laboratory at Poughkeepsie, N. Y. Construction is planned to begin early next month and is expected to be ready for occupancy by the end of the year.

ELECTRICAL BUSINESS OUTLOOK



Larger deliveries to fabricators abroad . . .



keeps pressure on prices; so soon . . .

Domestic Copper Prices May Increase

Will the price of copper and other metals used by utilities in the U. S. rise again this year? The current business situation makes these live and important questions. The current interest focuses on copper, partly because it's a key metal for utilities, partly because it's under the most pressure. But there's a good chance of price increases for other metals during 1955.

Each metal has its own special conditions. But two influences will operate this year to push up prices of all of them. One is the boom in business. It is concentrated in metal-using industries—automobiles, construction, electrical appliances. It has created great and sudden demand for all the major metals. And it came at a time when many businesses had reduced their stocks of metal—which makes the pinch temporarily worse.

Effect of Wage Increases Awaited . . . The other inflationary influence is wage increases. We are not into the wage boost season yet, but it's just over the horizon. And with a boom going, business is going to find it hard to refuse substantial wage increases this year. In good business years, wage increases mean price increases.

But there are also two widespread forces operating to hold price increases within bounds. One is the promise of a bigger supply of metal soon. There may be shortages now, because the boom got off to such a fast start. But the capacity of mines and mills is so great today that practically every metal can be produced in greater volume than is actually needed in the long run.

And then there's competition. There is so much competition between metals—copper-vs-aluminum, aluminum-vs-steel, zinc-vs-aluminum, etc—that producers try as they haven't tried for a long time to hold prices down. Steel, copper and aluminum are all competing with plastics, as well.

For **steel,** the prospect is for substantial wage increases some time this summer. That means a price increase. **Aluminum** has recently had an increase. There may be another if costs rise. But it is sure to be small; aluminum producers are acutely conscious of their competitive situation. **Lead and zinc** are special cases. Their prices have been more or less deliberately supported by government buying. **Copper** is another matter. The question here is whether producers can, or will keep the price at its present level until summer when the present squeeze on supplies may have let up substantially.

Right now, demand for copper is abnormal. Abroad, growing prosperity has pushed demand to remarkable heights. (See chart). And at home, automobile production at record winter levels, plus the greatest winter home-building in history, plus high production of other durables, has pushed copper use sharply higher.

At the same time, supply has been abnormally low. Strikes in the U. S. last summer, trouble in Chile and a strike in Rhodesia have all cut supply.

But by late summer, homebuilding may be over the hump of its latest boom. Auto production will be much slower, as it always is at that time. And it's a good bet that foreign buying will slacken off, too.

Better Supplies Seen By Summer . . . By summer, supply will be quite a bit larger—barring another round of world-wide strikes and political troubles. U. S. mine capacity is slated to increase by about 77,500 tons this year. Rhodesia is no longer on strike. And the troubles in Chile, while certainly not settled, are being handled more smoothly.

A couple of weeks ago, there were not many who would have bet against another copper price increase. Today, there's somewhat more hope, with Rhodesia back in production. There may still be a price rise. But it's likely to be mild and, if it comes, it may not last the summer.

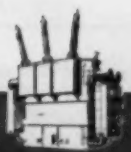
NEXT: GASEOUS INSULATION

An entirely new concept—*gas* as a power transformer insulation and coolant—is now being used by General Electric engineers at Pittsfield, Mass. The gas is sulphur hexafluoride chosen because of its high dielectric strength.

Lighter, quieter, safer . . . these are the predictions for this revolutionary design, a joint project of G.E. and the Consolidated Edison Company of New York. Above is a model of the 2000-kva, 69-kv units now being built.

Gas-insulated transformers will be ***safer*** because sulphur hexafluoride is non-flammable; ***quieter***—because pressurized gas conducts sound far less readily than liquid; ***lighter and more compact***—because the gas will eliminate heavy liquid insulation. General Electric Company, Schenectady 5, N.Y.

21-27



Power Transformer NEWS

Progress Is Our Most Important Product

GENERAL ELECTRIC

Utility Engineers Uphold Industry's Research

Counter charges of inadequacy made by college professors at AIEE Winter General Meeting in a six-pointed reply reporting utilities' activities and progress

For more than a year electric utility engineers have sought opportunities to counter criticism and proposals which have been leveled at research efforts of the nation's utilities. At the AIEE Winter General Meeting (EW, Feb. 21, p 92) the industry's engineers hit back in one of the liveliest sessions of the five-day meeting.

The controversy revolved around papers presented at the 1954 AIEE Winter Meeting and the American Power Conference by J. E. Hobson of Stanford Research Institute and W. A. Lewis of the Illinois Institute of Technology. The two professors had warned that utilities may be missing a sound bet for greater efficiencies by not conducting a more vigorous research program. At that time they proposed a long-range, industry-wide research program, possibly including a central laboratory and a staff of full-time scientists working on fundamental and applied research problems.

Another Paper, Same Theme . . . At the meeting this year Hobson and Lewis presented another paper along the same theme. They sought to evaluate the response to their earlier paper and to set out a few specific fields in which research is needed. In this second presentation they were joined by one-time utility engineer M. S. Oldacre, newly a Stanford professor. They found considerable support for their proposals especially among college faculties. While the authors reiterated their plea for an industry research budget on the order of one-tenth of one percent of the gross income of the electric utility industry, they made no brief for a single organization carrying on all of the research.

It was at this point that the utility engineers stepped in. Representatives from many sections of the country offered these replies:

1. Utilities are conducting numerous research projects that are not widely recognized by the industry as a whole.

2. It it more realistic to use existing facilities than to establish a central laboratory.

3. A start toward the coordination of research information has been made by Edison Electric Institute although little progress was reported.

4. Regulatory commissions might look askance toward heavy research expenditures by the industry.

5. Manufacturers are doing and will continue to do much of the necessary research in the electric utility equipment field.

6. A large-scale, central research program would have little effect in attracting engineers to the utility field.

Most of these replies came during floor discussion of the Hobson-Lewis-Oldacre paper. They were made by such men as T. G. LeClair, of Commonwealth Edison Co; Lloyd F. Hunt, Southern California Edison Co; H. P. Seelye, Detroit Edison Co; and W. B. Morton, Pennsylvania Power & Light Co.

Support For Hobson . . . But the discussion was not all one-sided. The research proposals won the vocal support from other university professors.

A fuller and more studied reply came from L. R. Gaty, Philadelphia Electric Co, who presented a paper on research in the electric utility industry. Like several of the other engineers arguing against the Hobson proposals, Gaty agreed that more research is needed, but he thought that most of it should be of the applied type.

The utility engineers appeared to agree with the university professors on two salient points: More research is needed in the electric utility field. A studied effort should be made to collect and disseminate the results of research programs which have been completed or are underway.

TECHNICAL NOTES

Modern system engineering gives lowest cost for industrial plants without building bottlenecks to hinder growth or the relocation of process equipment.

Thermostatic control can hold off clock-switched capacitors during cool days when kvars are not needed.

Corrosion of channels and angles of steel towers on a line subjected to conductor galloping is most vicious near the ground line where twisting and weaving forces concentrate.

Transformers are priced per pound about the same as the lowest priced cars produced by the "big three."

Lines surrounded by objects of comparable or greater height are likely to experience only about half the number of lightning flashovers as a similar line traversing open country.

Television interference with electric service can prove serious when severe winds topple antennas erected too close to utility lines.

Air velocity sufficiently high gives turbulence to break up the relatively thin film of still air adjacent to an overheated cable which thereby benefits from reduction of temperature drop between cable surface and air mass.

Hurricane Accounting Costs . . .

. . . totaling about $1.5 million for Long Island Lighting Co, are being considered by New York Public Service Commission

In a ruling, which left total revenues substantially unchanged, the New York Public Service Commission gave detailed consideration to costs of recent hurricane damage estimated at $1.5 million by the Long Island Lighting Co.

The order noted that "Essentially the proposals of the company were that it be permitted to make storm damage accruals by monthly charges to operating expenses, to accumulate such accruals as a reserve for storm damage, and to charge extraordinary storm damage costs thereto. As (Robert G.) Olmsted testified, storm damage costs are deductible for income tax purposes in the year incurred, so that the net effect on earnings would be approximately half of the costs involved. Stated another way, any reserve provided would cover storm damage costs equivalent, because of the income tax effect, to approximately double the amount in the reserve.

"Olmsted stated the company has insurance to cover storm damage on structures and buildings but no coverage for transmission or distribution lines where most of the storm damage occurs. He believed the recent frequency of the unusual storms indicated the necessity for making some provision out of electric earnings so that the costs might be spread over a number of years for rate making and accounting purposes (S.M. 879-99)."

Reserve To Reach $500,000

"The initial proposal was for accrual charges against operating expenses at the rate of $7,500 monthly ($90,000 annually) until the accumulated reserve reached $500,000. In event of a storm resulting in electric maintenance costs exceeding $250,000, such costs after giving effect to the resultant reduction in federal income taxes would be charged against the reserve to the extent of the balance therein, with any remainder to be charged directly to electric maintenance costs (Exhibit 172).

"Increased storm damage costs, the increase in the amount of property exposed to storms, and consideration of inclusion of street lighting and signal system damage prompted the company to modify the foregoing figures in presenting its 1954 estimates for this proceeding. As before noted, the 1954 estimate included an accrual (Table 4) of $120,000, or at the rate of $10,000 per month. As Olmsted explained, this amount was not considered as deductible for income tax purposes, since the tax deduction could be claimed only for actual storm damage. However, the effect would be to provide for storm damage about double the accumulated reserve; as he put it, the reserve would in six years, provide for a storm costing one and one-half million dollars (S.M. 1342-54).

"The foregoing reviews briefly the exhibits and testimony pertaining to storm damage and proposed storm damage reserves as presented prior to the advent of the three hurricanes of this year. The company thereafter renewed its application, submitting additional data and a modified request intended to supersede its initial proposals. This occurred after the close of the hearings, and its new application therefore is not a part of the formal record in this proceeding.

"The matter bears so directly upon operations and operating expenses that the occurrence of the three hurricanes and the subsequent modified application of the company should not be disregarded. Briefly its recent application of Nov. 15, 1954, is that storm damage accruals be made at the rate of $20,000 monthly ($240,000 annually) by charges against electric operating expenses, and that the reserve be available to absorb costs otherwise chargeable to expense of storms of any type occasioning total costs in excess of $250,000. An alternative, although not favored by the company, was also set forth, essentially that storm damage accruals at the suggested amount ($20,000 per month) be reduced to the extent of any amortization of storm damage of a prior period, that the 1954 storm damage costs be amortized over a three year

Public Offerings of Electric Utility Securities

(Thousands of Dollars)

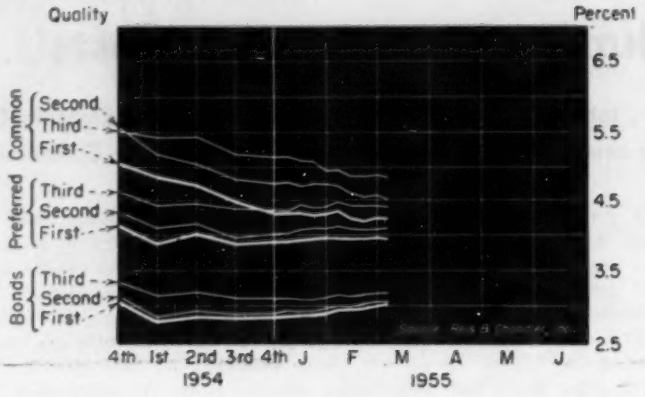
	1954			1953		
	New Money	Other	Total	New Money	Other	Total
Bonds, Notes, and Debentures	995,199	370,873	1,366,072	968,200	2,000	964,200
Preferred Stocks	212,048	159,973	372,021	169,244*	6,835*	176,079
Common Stocks (a)	354,356	2,006	356,362	539,578*	5,560	545,138*
Total	**1,561,603**	**532,852**	**2,094,455**	**1,671,022**	**14,395**	**1,685,417**
	First Quarter			**First Quarter**		
Bonds, Notes, and Debentures	412,850	40,000	452,850	199,800	2,000	201,800
Preferred Stocks	46,630	.....	46,630	70,717	.....	70,717
Common Stocks (a)	125,383	.....	125,383	166,092	.....	166,092
Total	**584,863**	**40,000**	**624,863**	**436,609**	**2,000**	**438,609**
	Second Quarter			**Second Quarter**		
Bonds, Notes, and Debentures	281,654	180,946	462,500	343,400	.....	343,400
Preferred Stocks	120,655*	70,304*	190,959	71,082*	6,835*	77,917
Common Stocks (a)	142,299	.....	142,299	169,429*	.....	169,429*
Total	**544,608**	**251,150**	**795,758**	**583,911**	**6,835**	**590,746**
	Third Quarter			**Third Quarter**		
Bonds, Notes, and Debentures	169,951	79,749	249,700	205,500	.....	205,500
Preferred Stocks	27,103	76,671	103,774	2,000	.....	2,000
Common Stocks (a)	67,142	2,006	69,148	114,217	2,237	116,454
Total	**264,196**	**158,426**	**422,622**	**321,717**	**2,237**	**323,954**
	Fourth Quarter			**Fourth Quarter**		
Bonds, Notes, and Debentures	130,744	70,278	201,022	213,500	.....	213,500
Preferred Stocks	17,660	12,998	30,658	25,445	.....	25,445
Common Stocks	19,532	.....	19,532	89,840	3,323	93,163
Total	**167,936**	**83,276**	**251,212**	**328,785**	**3,323**	**332,108**

Source: Reis & Chandler, Inc. * Revised.
Notes—Bonds are shown at principal amount and stocks at the price to the public. (a)Offerings to stockholders under subscription rights are included in same quarter as the date of stock record.

period through 1956, and that any subsequent substantial storm damage costs in excess of the accumulated reserve likewise be amortized.

"As before stated, these data are not a part of the formal record in this proceeding. The new application of the company will be considered by the commission in the usual manner, as with any application for authority to amortize or to accrue for extraordinary costs through periodic charges to operating expenses. Depending upon commission decision, storm damage amortization or accrual might range upwards to $250,000 per year for several years under the alternative not favored by the company, or continue for some time to come at $240,000 annually instead of the $120,000 reflected in the 1954 estimate of the company. The effect upon indicated return from electric operations will be indicated hereinafter."

Today's Utility Yields (%)



QUALITY	BONDS			PREFERRED STOCKS			COMMON STOCKS		
	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd
Mar. 3	3.02	3.04	3.17	3.94	4.10	4.39	4.22	4.51	4.82
Feb. 24	3.00	3.03	3.14	3.95	4.07	4.40	4.22*	4.56	4.85*

*Revised

FINANCIAL BRIEFS

Consolidated Gas Electric Light & Power Co of Baltimore is proposing to change its name to Baltimore Gas & Electric Co. Stockholders are asked to approve this change at the annual meeting to be held on April 1.

Cleveland Electric Illuminating Co Pres Elmer Lindseth has announced that stockholders will be asked at the annual meeting to be held April 26 to increase the number of directors from nine to eleven. Cyrus S. Eaton (Cleveland, Ohio, EW, March 7, p74) and Ralph M. Besse, executive vice president of the company, will be the new directors to be added. Said Lindseth: "With the continued expansion in the development of the company, the management feels it will be advantageous to increase the number of members on the board in order to gain added diversification and experience among its members."

Niagara Mohawk Power Corp will acquire the Adams Electric Light Co, Worth, N. Y., for $6,265.15 . . . Consulting engineering firm of A. C. Kirkwood & Associates has recommended to the Aberdeen, S. D., City Commission that it purchase and operate the system in that town now owned by **Northwestern Public Service Co.**

Utility Earnings

COMPANY	PERIOD MONTHS ENDED		NET INCOME 1954	NET INCOME 1953	EARNINGS PER COMMON SHARE 1954	EARNINGS PER COMMON SHARE 1953
Boston Edison	12	Dec.	$8,459,544	$8,024,448	$3.12	$2.96
Cincinnati Gas & Electric	12	Dec.	12,735,000	11,238,000	1.71(a)	1.56(a)
Connecticut Light & Power	12	Dec.	9,083,407	7,692,955	1.17(b)	1.03(b)
Dayton Power & Light	12	Dec.	8,439,000	8,150,000	2.88	2.78
Detroit Edison	12	Dec.	22,137,173	20,520,004	2.05	1.92
Niagara Mohawk Power	12	Dec.	27,760,000	26,343,000	2.11	2.03

Notes—All the figures shown above have been audited; (a) Based on 6,800,000 shares in 1954 and 6,505,000 shares in 1953; (b) Based on average shares.

Utility Financing

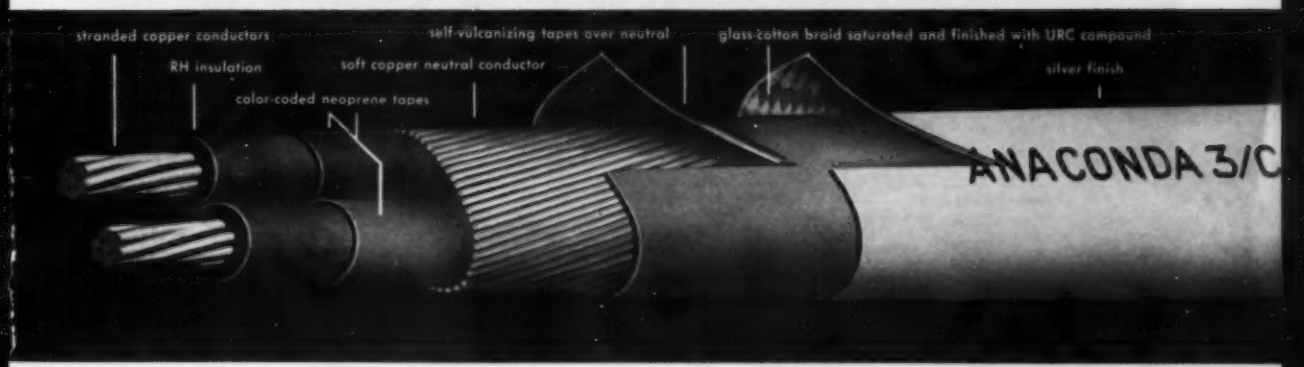
COMPANY AND DESCRIPTION	AMOUNT OF OFFERING (000)	OFFERING PRICE	YIELD TO PUBLIC
WEEK OF MARCH 3-9			
BONDS			
Atlantic City Electric—1st mtg 3¼% due 1985	$10,000	101.54%	3.17%
SCHEDULED FOR MARCH			BID DATE
BONDS			
Kansas Gas & Electric—1st mtg due 1985	$10,000	.....	Mar. 15
Arkansas Power & Light—1st mtg due 1985	18,000	.....	Mar. 30
PREFERRED STOCK			
Kansas Gas & Electric—60,000 sh $100 par	$6,000	.....	Mar. 15
Arkansas Power & Light—93,500 sh (to be offered on a sh-for-sh basis plus a cash adjustment to holders of outstanding 47,609 sh of $7 pfd and 45,891 sh of $6 pfd. Offer will run from about April 1 to 19. Unexchanged shares to be sold to underwriters and the old pfd to be redeemed at $110 a share)	.....	.....	.....
Southern Nevada Power—75,000 sh $20 par conv	1,500	.....	Mar. 15(a)
COMMON STOCK			
Oklahoma Gas & Electric—331,643 sh (to be offered commonholders on a 1-for-8 basis, record Mar. 16 to expire April 5)	.....	.....	.....
Arkansas Missouri Power—36,868 sh (to be offered commonholders on 1-for-12½ basis)	.....	.....	.....

Note—(a) William R. Staats & Co group, underwriters.

ANACONDA ANNOUNCES—NEW

SILVALINE 100-AMP service entrance cable

The *only* SE cable with URC† saturant and finish



Here's a new Underwriters Type SE service entrance cable that complies with NAHB Voluntary Adequate Wiring Code... and will help you boost kwhr sales.

The new Voluntary Adequate Wiring Code of the National Association of Home Builders calls for 100-amp service into the home.

Adequate capacity in service entrance for homes insures your future sales of electrical energy – because it removes the *initial* bottleneck to the sale of high-current appliances.

And now, Anaconda introduces the new Silvaline* 100-AMP (actually 115-amps) TYPE SE cable. Made with #2 AWG copper – and Type RH insulation.

Here are other advantages:

Uninterrupted Service. *Silvaline is the only service entrance cable with URC† saturant and finish* ... will not festoon or deteriorate. URC weatherproof protection will stay put – assures long life operation and eliminates trouble calls.

Eliminates Complaints: Silver finish on Silvaline takes any type or color of house paint... won't bleed through. Will not flake or peel. No complaints from homeowners when Silvaline is used.

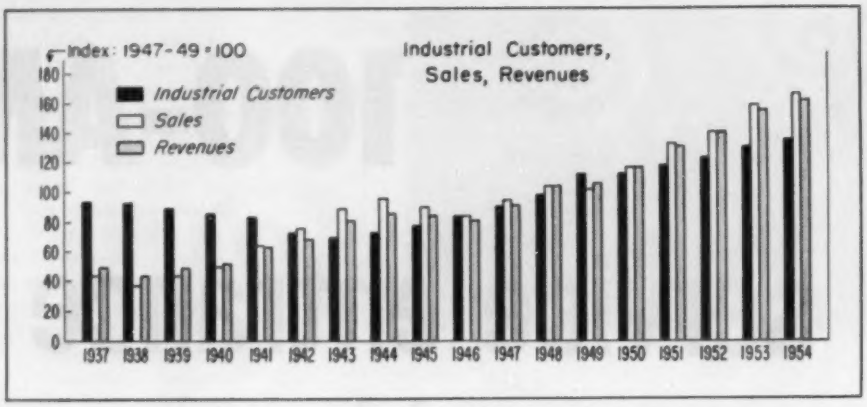
Silvaline 100-AMP cable is now available. For more information, contact your local Anaconda representative or write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 55228

*Reg. U.S. Pat. Off. †Utilities Research Commission

SILVALINE service entrance cable

ANACONDA®

STATISTICS



Industrial kwhr sales have soared from an index value of 43% of the 1947-49 average in 1937 to the 1954 figure of 165% Using the same base, revenues showed a like climb while customers grew more slowly—simple facts that point to the long-range trend of more and wider use of energy in industry.

Power Statistics . . .

		Latest Month	Preceding Month	Year Ago	Annual Change %
Capacity	Jan.	103.62	102.52	91.68	13.0
Peak—Class I Systems, million kw	Dec.	85.5	81.9	78.6	8.8
Estimated Dec. '55 Peak	Nov.	96.1	96.2	98.3	−2.2
Production—billion kwhr	Dec.	43.43	40.22	39.08	11.1
hydro		9.05	8.12	8.67	4.3
fuel		34.38	32.10	30.41	13.1
Sales—billion kwhr	Dec.	35.25	33.87	32.31	9.3
residential		11.15	10.07	9.77	14.0
Commercial		6.22	6.14	5.60	8.5
industrial		15.57	15.38	14.83	6.8
other		2.30	2.29	2.12	7.5
Fuel Consumption	Dec.				
coal—million tons		11.90	10.70	10.88	9.4
oil—million barrels		7.67	5.82	7.62	0.6
gas—billion cu ft		74.93	88.66	70.94	5.6
Net Income Class A & B Co's—$ million	Nov.	94.91	86.98	83.86	13.2
Residential Customers—millions	Nov.	43.04	42.95	41.89	2.8
revenue per kwhr		2.70¢	2.70¢	2.74¢	−1.5
avg. kwhr per customer		2,528	2,512	2,332	8.4
avg. annual bill		$68.26	$67.82	$63.90	6.8

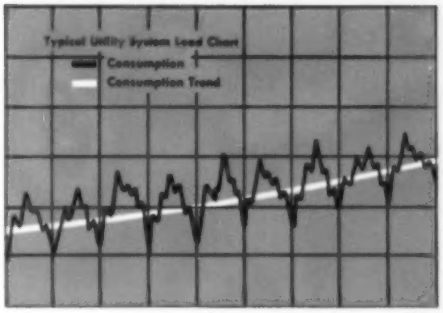
Business Statistics . . .

Indexes: 1947−49 = 100					
FRB Industrial Production	Jan.	130	128	124	4.8
ENR Construction Cost	Feb.	135.1	135.1	128.9	4.8
BLS Cost-of-living	Dec.	114.3	114.6	114.9	−0.5
NEMA Sales	Dec.				
insulation materials		138	124	133	3.8
electric appliances		84	90	69	21.7
household refrigerators		62	47	53	17.0
Wholesale prices	Jan.				
motors and generators		121.6	121.8	124.3	−2.2
transformers and regulators		128.1	128.1	128.1	....
switchgear and fuses		135.3	135.3	135.1	0.1
GNP—annual rate—$ billion	4th Qtr.	362.0	355.5	360.5	0.4

The best assurance of uninterrupted service from sunup to sunup is *dependable equipment.* Moloney has been building transformers to meet the needs of the electric utilities for over 58 years . . . transformers that have proven so serviceable, that the Moloney trademark has become the "Sign of Quality."

So, make it Moloney all along the line . . . power transformers in any Kva rating, load tap changers, regulating equipment, or distribution transformers . . . for you know that Moloney Transformers will serve you and your customers from sunup to sunup —year in and year out.

MC-59-1



Utility demand charts show that more and more electricity is being used around the clock and around the calendar.

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Step Voltage Regulators • Regulating Transformers • Load Tap Changing Transformers • Load Center Transformers • Unit Substations • Network Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES AT ST. LOUIS 20, MO. AND TORONTO, ONT., CANADA

only Allis-Chalmers builds a complete line of power breakers that will open at full-rated speed under all conditions, because . . .

only Allis-Chalmers
builds all breakers

Mechanically Trip-Free*...

*

Only in mechanically trip-free breakers are contacts and mechanisms uncoupled . . . enabling contacts to open without restriction from mechanism. Trip-free under all conditions, without qualification, on both pneumatic and *Pneu-Draulic* operators. Call your nearby A-C office or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4619

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Progress In Switchgear

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